

# Amateur Radio

Volume 77 Number 5  
May 2009

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## REVIEW: IC-7200



**A lot of radio in a  
compact package**

*plus*

**The underestimated magnetic  
loop HF antenna: *an overview***

**WICEN: Fires out but more to do**

ISSN 0002-6859



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# Amateur Radio

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## Our Cover this month

Our cover this month features the Icom IC-7200 transceiver.  
Read the review by well known amateurs Bill Roper VK3BR  
and Ron Fisher VK3OM starting on page 22.

### Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, 'How to write for Amateur Radio' is available from the National Office on receipt of a stamped self-addressed envelope.

### Back Issues

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### Photostat copies

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### Disclaimer

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## Editorial

Peter Freeman VK3KAI

### AGM weekend of activities

As this issue of AR hits your mailbox, the WIA Annual General Meeting weekend of activities will be either about to occur or will have just occurred.

Firstly, I must declare an interest in these activities on at least two counts:

As a WIA member, it is in my interest to directly observe formally that which has happened in MY (our) organisation over the past 12 months and to be able to put issues before the Board members in an open public forum. Surely this is part of being involved in any open democratic organisation. We all have the opportunity to put our thoughts forward during the year, yet such ideas may not reach broader public awareness.

Yes, as Editor, I am in a unique position to raise my thoughts, yet I usually prefer to put any ideas forward in more subtle ways, rather than attempting to use my position. I also recognise that the WIA could choose to censor any inappropriate thoughts that I might raise. That also is a consequence of being part of such a representative organisation.

Secondly, many will know that I originated the idea of an Australian annual technical conference with its focus on matters related to VHF, UHF and microwave amateur communications – the annual GippsTech conference hosted by the Eastern Zone Amateur Radio Club (Inc.) (EZARC).

The WIA has invited the EZARC to host this year's AGM and to organise an extra GippsTech event as a supporting focal event. EZARC decided to accept the offer, noting that we should make clear that this was to be an extra event – hence the name "GippsTech – Special Event".

Some people seem to have confused the two events – the Special Event and the forthcoming (normal) GippsTech conference, which will occur in early July, as is the usual course of events. This is unfortunate, as clearly some have not read the information available. I agree that there is little detailed information about GippsTech 2009 on the EZARC website, but that is as usual. We rarely have any detailed information until late May or early June, apart from the actual dates for the event. Part of this is due to

the habits of those willing to present – they will often leave it until quite late to offer up a topic for presentation!

As Chair of the GippsTech Organising Committee (really just the EZARC Committee acting with a different focus), I have deliberately invited particular speakers to present on a variety of topics for the Special Event: some are well known to GippsTech regulars, others are on subjects I saw as being topical and of potential interest to a broader audience than the usual GippsTech attendees.

All the work by the people involved will soon show the results – the Special Event will be over, with appropriate reports in the June issue of AR. I look forward to meeting as many attendees as possible over the weekend.

And, of course, considering attending the annual GippsTech event over the weekend of July 11 and 12 for a full-on dose of all things VHF, UHF and microwaves! Further details will be available soon on [www.vk3bez.org](http://www.vk3bez.org)

### Emergency communications

As you read this editorial, World Amateur Radio Day will have recently occurred, with a focus this year on the role of the amateur service in providing communications services during emergency situations, either real or in training exercises.

Included in this issue are three articles that continue the record of the service of our hobby during the disaster events of this year – more stories from the Victorian bushfires.

I have also included two accounts of Club activities during the John Moyle Memorial National Field Day, received just in time for inclusion in this issue. Whilst this contest can provide an excellent opportunity for fun club activities and camaraderie, we must remember that the "John Moyle" is really all about preparing for the provision of communications when least expected – during emergency situations.

I am sure that we shall have some further reports in due course, possibly in the same issue in which we publish the contest results.

73 Peter VK3KAI

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# Promoting amateur radio

A few weeks ago the WIA Board met for a face to face meeting over a weekend. We only have two or three such meetings a year because to travel and meet is expensive. Mostly we rely on the phone and email for the rest of the time.

One important aspect of meeting personally is that issues can be explored that are hard to address by other means.

I have previously pointed out that the Exam Service statistics show that the existing demand met by the introduction of the Foundation licence has now been met, and that our task is now to promote amateur radio.

How we do that became one of the important issues discussed at the meeting.

Do we have to accept that amateur radio today must be different from amateur radio in the past? Can amateur radio be relevant to today's world? Can we accept change? But how do we see amateur radio as relevant?

There is no simple solution. There may be a number of opportunities with a number of solutions. One conclusion that was clear was that we needed to consult with those who are on the front line, particularly the clubs.

Several threads emerged.

One was that amateur radio should be promoted to those groups who had interests that would be enhanced by the communication capabilities that the amateur service's family of frequencies can offer. One group are those who are involved in boating, particularly offshore. Another group are the four wheel drive people who tour the inland.

Do we advertise in their magazines? Do we participate in their major meetings? Do we use our website better to get the message to those people? Once we have established an interest, who follows up that interest?

Another thread was the importance of attracting young people. But how do we do that? Encourage radio clubs at schools? Hope that there are teachers who are interested in amateur radio? But unless it is relevant to the curriculum, will the schools be able to find time for such activities?

The Scout groups are obviously an important resource, and groups exist in some states that really do encourage the interest.

ARISS is one tool that is effective in attracting young people, particularly school children, to the magic of amateur radio in a modern world.

Quite apart from these specialist groups we need to promote amateur radio to the community generally.

How do we do that?

Interestingly, there is a view that it may be an easier task in regional areas. There a club may have access to a local radio station, a local newspaper and even, in some areas, a local television station, all looking for local news.

Apart from providing stories for local media, clubs may participate in local activities and promote amateur radio.

The role of the clubs is critical.

It is the club that is part of the local community, it is the club that may have the will, the skill and the means to attract, train and assess. The word "may" in the last sentence is important. We must recognise that not all clubs wish to participate in promoting amateur radio, training and assessing those who wish to participate. Some clubs were formed to promote particular interests, and what we are talking about here is not one of them. But merely recognising the fact is not sufficient. If the WIA office sends someone seeking to become an amateur to a club that is not interested, we may do more harm than if we had done absolutely nothing.

There may be another aspect to the reluctance of some clubs to train. That is, uncertainty as to how to go about it. Is there a need for a training video, so amateurs, perhaps in remote areas, can see how it should be done?

But what should the WIA do? How can we help?

One positive decision that we have made is to encourage clubs to undertake projects and activities to attract new amateurs through the Club Grant Scheme. We have also made it easier to directly purchase the Foundation Licence

Manual from the WIA website.

It is fairly easy to make a list of other things that may help. It goes something like this:

Make the WIA website more attractive to those who are interested in becoming radio amateurs;

Produce a training video and make it available for download from the WIA website or available on disk at a cost as low as possible;

Produce and make available posters and pamphlets for use by clubs and groups promoting amateur radio;

Produce a short promotional video;

Produce "Press Kits", with background information, and generic photos for use by clubs;

Produce short video clips that can be made available for television use;

Provide guides and material that can be used by those talking to schools;

Distribute to clubs releases that can be provided to local newspapers and radio stations;

Develop kits that can be used to promote amateur radio to special interest groups;

Encourage stories and features in major newspapers;

Ensure that we refer people who seek to become amateurs to appropriate clubs.

That list is not exhaustive. Nor does it really identify what matters, and we do not even know what the clubs would see as useful. The WIA must apply what resources it has selectively and effectively.

We need advice. We see the Advisory Committees playing a role in developing advice, perhaps in some places encouraging input. Perhaps it would be a good idea to work with three or four clubs in different environments to test different approaches and tools.

Once again, the more feedback we receive the more likely we are to get it right.

Two of our Directors have accepted a special responsibility for refining this program and making it effective. If you have suggestions, do share them by letter or by email to [secretary@wia.org.au](mailto:secretary@wia.org.au)

## 2009 Club Grant Scheme targets new projects

The WIA Board at its face to face meeting on 1 and 2 March 2009 reviewed the Club Grant Scheme's operation in 2008, and resolved to conduct the scheme this year, with a budget of \$6,000.

In accordance with the Rules adopted last year, the Board identified two kinds of project that would be supported this year, in particular, projects and activities (to be conducted before 1 April 2010) to attract new amateurs and projects supporting emergency communications and preparedness for emergency communications.

It was agreed that properly establishing a club's Membership Percentage (which is defined in the Club Scheme Rules on the WIA website), would be a condition precedent to participation this year.

Details will be published shortly.

## WIA Welcomes Fibre-to-the-Home Decision

The Federal Government recently announced its decision on Australia's National Broadband Network. In a surprise move, instead of deploying a widely expected half-way-house fibre-to-the-node (FttN) solution from a consortium of companies, the Government is moving ahead with its own full-blown 100Mb/s fibre to the home rollout (FttH).

WIA Director Phil Wait commented on the decision, pointing out that any fibre-to-the-node solution which did not include Telstra would have resulted in a variety of 'alternative' access technologies used to connect the 'node' to customers premises.

This decision appears to remove the possibility of widespread interference to radio communications from any network-wide adoption of BPL technology, but still leaves as a concern the possibility of interference from in-home use of BPL as an internal distribution technology said Phil.

## Challenge to Australian 70cm Band Spectrum

The Australian Communications and Media Authority (ACMA) has released a further consultation paper addressing future arrangements in the 400 MHz spectrum between 420 and 520 MHz

This paper follows on from a previous discussion paper on spectrum options for this band. Of interest was the spectrum 420 MHz to 430 MHz and 440 MHz to 450 MHz where the Defence Department is the Primary User and the Amateur Service is a Secondary User.

The WIA's submission argued for its continued use of the spectrum for UHF links in support of emergency services networks, and an Amateur Television Channel for the purposes of future training options particularly digital television.

The previous consultation paper sought comments in response to 31 questions; of particular interest to the amateur community are the questions:

ACMA seeks comments on the option of identifying parts of the 400 MHz band for low power single frequency applications under a class licence;

ACMA seeks comments on the existing and potential defence uses of the 440 – 450 MHz band;

ACMA seeks comments on the possibility of opening up some or all of the 440 – 450 MHz band for greater use by the land mobile service for purposes other than defence.

The latest ACMA paper indicates that the segment from 440 MHz to 450 MHz is out of scope, however the segment 420 MHz to 430 MHz is being consider for use for Government services.

WIA Director Peter Young commented that although the pressure has eased somewhat, the WIA will continue to press its case through further submission(s) and representation on the ACMA 400 MHz Working Group.

## Commemorative Event to mark 40 Year anniversary of Apollo Moon Landing

A group of radio amateurs is planning a commemorative event to mark this year's 40th anniversary of the Apollo 11 moon landing. Called 'Echoes of Apollo', various activities are planned around June and July. The organisers are negotiating with some of the world's largest and most capable amateur radio moon-bounce stations, and also some deep space radio facilities.

The idea is to hook-up people from various locations using moon-bounce and, if the antennas are large enough, possibly achieving near broadcast

quality audio, you might say, a kind of 'Back-to-the-Moon' day.

Also planned is an HF radio weekend, with HF stations set up near original support sites for the Apollo 11 mission. The WIA will publicise the event and issue certificates to amateurs making contact with event stations. The EME event is planned for the 27th June this year and the HF event is planned for the weekend and the Monday of 18-20th July, so time is very short.

The WIA will bring more information on this event as it comes to hand.

## WICEN Activation — Oil Spill Emergency Clean Up

On Sunday 15 March 2009, the North Coast Region Specialist Communications Group was activated to provide communications support for the "Oil Spill Emergency" Clean Up operation.

The Sunshine Coast Amateur Radio Club's WICEN Caravan (VK4WSC) and members of the North Coast Region (EMQ), Specialist Comms Group provided communications support to the clean up, based at Kawana Surf Club.

The group is using the facilities of the WICEN caravan and the local amateur repeater network, along with 2 fixed SES, 2 portable SES repeaters, as well as 30+ SES handheld radios to service the operation.

**David Rankin VK3QV/9V1RH SK**  
David Rankin VK3QV, 9V1RH passed away in Singapore on 19 March 2009.

David was always the enthusiastic amateur, originally involved with Victorian Division, then the Federal Executive, and was WIA Federal Vice President for a number of years.

David lived in Singapore since around 1972, and living in Singapore he developed both a real interest in and understanding of amateur radio in the developing countries of what had become his part of the world. He actively participated in what had become his home society, Singapore Amateur Radio Transmitting Society (SARTS). He was a great supporter of SEANET. His real interest became IARU Region 3. He was secretary of IARU Region 3 from 1973 to 1982, Chairman of Region 3 from 1982 to 1994, and a Director from 1994 to 1997.

ar

# An overview of the underestimated magnetic loop HF antenna

Leigh Turner VK5KLT

It seems one of the best kept secrets in the amateur radio community is how well a small diminutive magnetic loop antenna can really perform in practice compared with large traditional HF antennas. The objective of this article is to disseminate some practical information about successful homebrew loop construction and to detail the loop's key distinguishing characteristics and unique features. A magnetic loop antenna can very conveniently be accommodated on a table top, hidden in an attic/roof loft, an outdoor porch, patio balcony of a high-rise apartment, or any other space constrained site.

A small but efficacious HF antenna for restricted space sites is the highly sought after Holy Grail of many an amateur radio enthusiast. This quest and interest is particularly strong from amateurs having to face the prospect of giving up their much loved hobby as they move from suburban residential lots into smaller restricted space retirement villages and other communities that have strict rules against erecting elevated antenna structures.

In spite of these imposed restrictions, amateurs do have a practical and viable alternative means to actively continue the hobby using a covert in-door or portable outdoor and sympathetically placed small magnetic loop.

This paper discusses how such diminutive antennas can provide an entirely workable compromise that enable keen amateurs to keep operating their HF station without any need for

their previous tall towers and favourite beam antennas or unwieldy G5RV or long wire. The practical difference in station signal strength at worst will be only an S-point or two.

Anyone making a cursory investigation into the subject of magnetic loop antennas using the Google internet search engine will readily find an overwhelming and perplexing abundance of material. This article will assist readers in making sense of the wide diversity of often times conflicting information with a view to facilitate the assimilation of the important essence of practical knowledge required to make an electrically-small loop work to its full potential and yield good on-air performance.

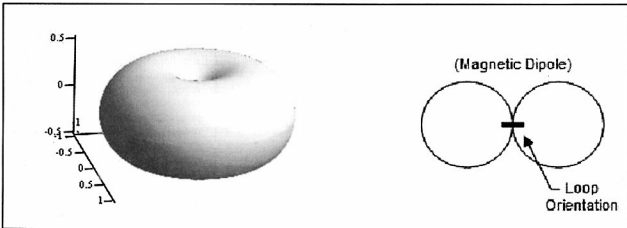
## A few facts

A properly designed and constructed small loop of nominal one metre diameter will outperform any antenna type except

a beam on the 10 m/15 m/20 m bands, and will be within an S-point (6 dB) of an optimised mono-band beam that is mounted at an appropriate height above ground.

Magnetic loops really come into their own on the higher HF bands from, say, 40 m through to 10 m; oftentimes with absolutely stunning performance rivaling the best conventional antennas. Easily field deployable and fixed site tuned loops have been the routine antenna of choice for many years in professional defence, military, diplomatic, and shipboard HF communication links where robust and reliable general coverage radio communication is deemed mandatory.

So where is the catch; if the small loop is such a good antenna why doesn't everyone have one and dispense with their tall towers? The laws of nature and electromagnetics cannot be violated and



Magnetic loop radiator pattern diagram

the only price one pays for operating with an electrically-small antenna is narrow bandwidth. Narrow instantaneous bandwidth rather than poor efficiency is the fundamental limiting factor trade-off with small loops.

Any small antenna will be narrow band and require tuning to the chosen operating frequency within a given band. Users of magnetic loops must be content with bandwidths of say 10 or 20 kHz at 7 MHz or a little more than 0.2%. They are content as long as the antenna can be easily tuned to cover the frequencies that they wish to use. For a remotely sited or rooftop mounted antenna this requires just a modicum of that ingenuity and improvisation for which radio amateurs are renowned.

A small loop antenna for transmitting is defined as having a circumference of more than one-eighth wavelength but somewhat less than one-third wavelength which results in an approximately uniform current distribution throughout the loop and the structure behaves as an inductance.

The doughnut shaped radiation pattern is in the plane of the loop with nulls at right angles to the plane of the loop. The loop self-inductance can be resonated with a capacitance to form a high-Q parallel tuned circuit. The attainment of a high-Q tells us that the loop antenna is not lossy and inefficient.

When power is applied to the loop at its resonant frequency all of that power will be radiated except that portion absorbed in the lumped  $I^2R$  conductor and capacitor losses manifesting as wasteful heat. With proper design these series equivalent circuit losses can be made negligible or at least sufficiently small compared to the loop's radiation resistance that resultantly high intrinsic radiation efficiency and good antenna performance can be achieved.

Current through the loop's radiation resistance results in RF power being converted to electromagnetic radiation. However, since the small loop's radiation resistance is very small compared to that of a full sized resonant  $\frac{1}{2}\lambda$  dipole, getting this favourable ratio of loss to radiation resistance is the only 'tricky' and challenging part of practical loop design and homebrew construction.

Through utilizing a split-stator or a butterfly style air variable capacitor construction or a vacuum variable capacitor, low loss can be achieved in the tuning capacitor. Conductor loss can then be controlled by optimal choice of the diameter of copper tubing used to form the loop element and paying very careful attention to low ohmic interconnections to the capacitor such as welded or silver soldered joints, etc. With 100 Watts of TX drive power there are many tens of Amperes of RF circulating current

and Volt-Amps-Reactive (VAR) energy flowing in the loop conductor and tuning capacitor.

Capacitor losses are further minimised by welding the rotor and stator plates to the stacked spacers to eliminate any residual cumulative contact resistance. When connected across the loop terminals the butterfly construction technique inherently eliminates any lossy rotating contacts in the RF current path.

The configuration permits one to use the rotor to perform the variable coupling between the two split stator sections and thus circumvent the need for any lossy wiper contacts to carry the substantial RF current. Since the fixed stator plate sections are effectively in series, one also doubles the RF breakdown voltage rating of the composite capacitor.

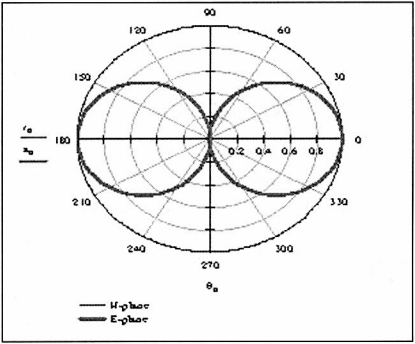
In view of the fact the loop antenna is a high-Q resonant circuit, many kilovolts of RF voltage can be present across the tuning capacitor and appropriate safety precautions must be taken. Loop antennas capable of handling a full 400 Watts PEP are readily achievable when appropriate construction and tuning components are selected.

Although loop antennas have deceptively simple appearance, they are complex structures with radiation patterns and polarisation characteristics dependent on whether they are fed in a balanced or unbalanced fashion. The method of feeding and matching the loop resonator, ground plane configuration, as well as the geometric form factor and physical proportions of the loop element itself are all fertile ground for experimentation.

Various matching methods include series capacitor, transformer coupled subsidiary shielded-Faraday loop, and gamma-match, etc; each with their respective merits.

Small loop antennas have at least two simultaneously excited radiation modes: a magnetic and an electric folded dipole mode. When the ratio proportions of loop mode and dipole mode radiation are juggled to achieve equal strengths some radiation pattern asymmetry results and a useful degree of uni-directionality can be achieved with a typical front to back ratio of about 6 dB or so.

The small loop with its doughnut shaped pattern exhibits a typical gain of 1.5 dBi over average ground and a gain of 5 dBi when deployed with either



Magnetic loop field amplitude diagram

short radials (the length of each radial need only be twice the loop diameter) or mounted over a conductive ground plane surface. By comparison a large  $\frac{1}{2}\lambda$  horizontal dipole mounted  $\frac{1}{4}\lambda$  above average ground has a gain of 5.12 dBi and a  $\frac{1}{4}\lambda$  vertical with 120 radials each  $\frac{1}{4}\lambda$  long has a gain of 2 dBi over average ground. The front to side ratio of a loop is typically 20 to 25 dB.

However the small loop has one very significant advantage over any other antenna due to its unique radiation pattern. If the vertically oriented loop's figure-8 doughnut pattern radiation lobe is visualised standing on the ground the maximum gain occurs at both low and high angles, radiating equally well at all elevation angles in the plane of the loop, that is, radiation occurs at all vertical angles from the horizon to the zenith.

Because the loop radiates at both low and high angles, a single loop can replace both a horizontal dipole and a vertical. This is particularly beneficial on 160, 80 and 40 m where the loop will provide outstanding local/regional coverage and easily match and often outperform a tall  $\frac{1}{4}\lambda$  vertical for long haul DX contacts, that is, an exceptionally good general purpose antenna.

Energy radiated by the small loop is vertically polarised on the horizon and horizontally polarised overhead at the zenith. It will be quickly realised that a loop has the distinctive property of providing radiation for transmission and response for reception over both long distances and over short to medium distances. This is achieved by virtue of low angle vertically polarised propagation in the former case and by means of horizontally polarised oblique incidence propagation in the latter

case. In contrast, a vertical monopole is useful only for low angle vertically polarised propagation since it exhibits a null overhead and poor response and radiation at angles in excess of about 45 degrees. Such antennas are of course very useful for long distance communication by means of low angle sky wave skip propagation, or for short range communication via the ground wave propagation mode.

In further contrast, a horizontal  $\frac{1}{2}\lambda$  dipole (or beam arrays comprising dipole elements) at a height above ground of just a fraction of a wavelength (as opposed to idealised free space or mounted very high) exhibits maximum polar response directly overhead (good for NVIS) with almost zero radiation down near the horizon. Such popular 'cloud warmer' antennas in residential situations as the surreptitiously hung ubiquitous G5RV, end-feds, dipoles, inverted-V, etc. are thus most useful for short to medium range communication in that portion of the HF radio spectrum where oblique incidence propagation is possible.

Importantly it should be noted when comparing small loops with conventional antennas that a 20 m Yagi beam, for example, must ideally be deployed at a height above ground of at least one wavelength (20 m) in order to work well and achieve a low take-off angle tending towards the horizon for realising optimal no compromise long-haul DX operation.

Unfortunately such a tower height is impractical in most residential zoning rule situations imposed by municipal councils and town planners. If the Yagi beam is deployed at a lower 10 m height then a diminutive loop will nearly always

outperform the beam antenna.

This writer never fails to be amused by folks who acquire a potentially high performance Yagi HF beam and sacrilegiously deploy it in suboptimal installations in respect of height above ground or proximity to a metal roof. The problem worsens on the lower bands below 20 m where the resultant lobe pattern direction is not at all very conducive to facilitating good DX communication.

In comparison to a vertically mounted/oriented loop, the bottom of the loop does not need to be more than a loop diameter above ground making it very easy to site in a restricted space location. There is no significant improvement in performance when a small loop is raised to great heights; all that matters is the loop is substantially clear of objects in the desired direction of radiation! Mounting on an elevated roof ground-plane yields excellent results.

A good HF antenna for long haul DX requires launching the majority of the TX power at a low angle of radiation; things a good, efficient and properly installed vertical, a properly sited small magnetic loop, and a big multi-element beam atop a very tall tower do very well.

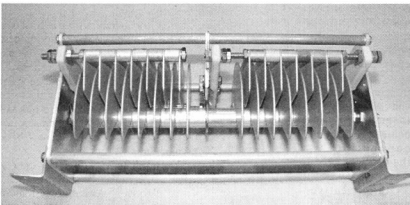
## Receiving properties

In a typical high noise urban environment a loop will nearly always hear more than a big beam on the HF bands. The small magnetic loop antenna (a balanced one) responds predominately to the magnetic component of the incident EM wave, while being nearly insensitive to the electric field component; which is the basic reason why loops are so impressively quiet on receive; often times dramatically so.

They will pull in the weak signals out of the ambient noise and you will very likely receive stations that you would never hear when switching across to a vertical, dipole or beam antenna.

In a propagating radio wave the magnitude of the electric vector is 120Ω or 26 dB greater than the magnitude of the magnetic vector, the difference being due to the intrinsic impedance of free space (377 Ohms).

On the other hand the induction fields associated with man-made noise have electric E-field components many times greater than a normal radiation field (radio wave). While a dipole or vertical



Split stator butterfly capacitor



antenna is sensitive to both the electric and magnetic components of a wave, the small loop is responsive only to the magnetic H-field component and it will be substantially 'blind' and offer a high degree of rejection to pickup of undesired man made noise and atmospheric disturbances.

Hence the widely used term 'magnetic loop' antenna to signify this field discrimination to the components of the incoming incident EM wave. Antenna theory treats the loop as the electrical conjugate of the dipole, that is, the loop is a 'magnetic dipole' while an ordinary dipole is an 'electric dipole'.

Significantly, a small loop antenna will typically produce a signal-to-noise ratio (SNR) that is some 10 to 20 dB greater than a horizontal dipole in a noisy urban environment and an even greater improvement in SNR when compared to a vertical antenna as a result of the man-made noise comprising a strong electric field component and being largely vertically polarised.

The most important criterion for reception is the signal to noise ratio and not antenna gain or efficiency. In the HF bands, particularly at the low-mid frequency portion, external man-made and galactic/atmospheric noise is dominant.

The magnetic loop antenna has one other important practical advantage in receive mode. The aforementioned high-Q resonator imparts a very narrow band frequency selective bandpass filter ahead of the RX front-end stages.

Such an incidental preselector comprising the antenna itself imparts greatly improved receiver performance on the congested lower HF bands with high power broadcast stations and particularly when lightning strikes and atmospheric electrical discharges are present in the regional area. Unwanted overload causing and adjacent-channel QRM interference signals are rejected or heavily attenuated.

As well as eliminating strong-signal overload and intermodulation effects, the filtering dramatically reduces the amount of lightning induced broadband impulse energy fed to the RX front-end and weak signals can still be heard when reception under such adverse conditions was previously impossible.

It is these collective characteristics of small loop antennas that enable them

to often very significantly outperform their large dipole, Yagi or Quad beam counterparts during direct A/B comparative testing. Conversely in TX mode the antenna's inherent filter action selectivity causes any transmitter harmonics to be greatly attenuated and not radiated. This can help with eliminating some forms of TVI.

## Construction and siting issues

Without a good quality low-loss split stator or butterfly or vacuum variable capacitor of adequate RF voltage and current rating, it is quite futile building a magnetic loop antenna and expecting it to yield the impressive results of which it is potentially capable.

The minimisation of all sources of loss is particularly important in TX mode. By virtue of the shorter rotor, the butterfly style capacitor has slightly lower rotor loss than the split-stator construction style. The tuning capacitor is undoubtedly the single most critical component in a successful homebrew loop project.

Although more expensive and harder to find, vacuum variable capacitors have a large capacitance range in respect of their min/max ratio and allow a loop to be tuned over a considerably wider frequency range than that achievable with an air variable capacitor. Vacuum capacitors also have lower intrinsic losses than most air variables.

Good quality Jennings vacuum variable capacitors and a multitude of Russian made equivalents can be readily found on the surplus radio parts markets and eBay, as can their associated silver-plated mounting and clamp hardware to ensure a low contact resistance connection to the loop antenna conductor.

Other creative means can also be used to fashion a

high VAR rated low-loss capacitor such as trombone, piston, or interdigitated meshing plate configurations. Air is always the preferred dielectric as most other materials have high loss tangents and dissipation factors.

Whether a vacuum or air variable or homebrew capacitor is chosen, their mechanical shafts can be readily interfaced to a reduction gearbox and motor drive to facilitate easy remote tuning of a roof top or covert loft mounted loop. The antenna tuning can be manual or automatic based on VSWR sensing and a self-tuning servo system to control the drive motor.

Failure to pay very careful, strict attention to construction details in relation to eliminating all sources of stray losses and making bad siting choices such as close proximity to ferrous materials are the two main reasons why small magnetic loop antennas sometimes fail to live up to their performance potential; instead behaving as a proverbial 'wet noodle' with associated poor signal reports. Conversely a well built/sited loop is an absolute delight.

Transmitting loop antennas intended for optimal coverage of the most popular portion of the HF spectrum from 3.5 MHz to 30 MHz are best segregated into at least two distinct loop sizes. A nominal 0.9 m diameter loop for covering all the upper HF bands from 20 m through to



Vacuum capacitors

10 m (and perhaps also tunable down to 30 m depending on capacitor min/max ratio), and a 2 m diameter loop for covering the lower bands 80 m through to 30 m. For best operation down at 160 m and improved 80 m performance increased loop diameters of 3.4 m to 4 m should be considered.

Top band operation at 1.8 MHz is always the hardest challenge for any antenna type, small loops (typical dimensions of  $0.02\lambda$ ) included, but their on-air performance can nevertheless be authoritative with a commanding signal presence.

There are however, no 'free lunches' (and few cheap ones) when shrinking the size of antennas as the free space wavelength has not yet been miniaturized by nature redefining the laws of physics! Consequently antennas of such diminutive size must always be placed into proper perspective when compared with the performance attainable from a full-sized  $\lambda/2$  horizontal dipole for 160 m.

Most amateurs do not have sufficient residential block size and/or mast height in a fraction of wavelength to accommodate a 160 m dipole that works

properly with a decent radiation efficiency and ability to put its radiated power in a useful direction. Similarly, reasonably efficient and efficacious verticals for 160 m operation unfortunately exceed, by a great margin, the height permitted by local council and residential building code regulations.

The performance on the 160/80 m bands will be highly dependent on what antenna you use as a reference comparison, for example, a centre-loaded mobile whip or full size dipole/monopole, or whatever and what path is used, NVIS, ground wave, sky wave, etc.

The loop conductor diameter is determined by the desired loss resistance due to skin-effect, and choices can range from modest 6 mm copper tubing to large bore 100 mm copper or aluminium tube. Commonly used conductor diameters used to construct a magnetic loop are 20 mm and 32 mm soft copper tube.

Note that the radiation efficiency is not related to the loop size. Loop antenna efficiency is determined by the conductor tube diameter and its conductivity. This conceptual notion is counterintuitive for many folks.

A small loop will also be efficient and radiate power very effectively on 80 m and 160 m but the resultant L/C ratio and stored energy will often be such that the loop's Q factor will be so high as to yield an impractically small instantaneous bandwidth that is not useful for SSB communication purposes.

Achievable bandwidth is roughly proportional to loop size/diameter and Q is inversely proportional to the loop diameter. Depending on its construction, a small loop of nominal one metre diameter can exhibit an intrinsic radiation efficiency of 90% over the 1.8 to 30 MHz frequency range.

Copper tubing is the preferred material to fabricate the loop as it has a higher conductivity than aluminium. Larger size semi-rigid Heliax coax such as LDF550 will conveniently make excellent loop construction material for the smaller diameter 20 m to 10 m HF band loops when run at the 100 Watt power level.

In relation to resistance and conductivity, small loop antennas inherently exhibit very low radiation resistances, which compete with the ohmic resistances of the loop conductor and the resistances from connections and

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welds, including the tuning capacitor connection.

Magnetic loop antennas will typically have a radiation resistance in the order of 100 to 200 milliohms. This means that every additional milliohm caused by a poor contact will cost you one percent efficiency. That is why professional magnetic loop antennas for transmitting purposes will never have mechanical contacts and everything including the capacitor plates should be welded or soldered.

It is common to experience 60 Amperes or more of RF circulating current in the loop and capacitor when fed with several hundred watts of power.

In the practical deployment and siting of a loop antenna there are extrinsic factors of both a beneficial and deleterious kind affecting the radiation and loss resistances when the loop is not strictly deployed in a free space scenario.

When the loop is mounted over a perfectly conducting ground plane reflector or copper radial wire mat, an electrical image is created that effectively doubles the loop area. This in turn beneficially increases the loop's radiation resistance by a substantial factor of four times. Such a situation is easy to facilitate.

Conversely if the loop is placed over average ground (a reasonable reflector) the radiation resistance increases but a reflected loss resistance is also introduced due to transformer effect coupling near-field energy into the lossy ground.

Similarly when ferrous/iron material is

too close, the magnetic near-field of the loop will induce by transformer action a voltage across the RF resistance of the material causing a current flow and associated I<sup>2</sup>R power loss. This situation might arise for example when the loop is mounted on an apartment balcony with nearby iron railing or concrete rebar, or similar; the deleterious influence can be minimised by simply orienting the loop to sit at right angles to the offending iron or steel material.

Another loss contributing component is due to current flowing in the soil via capacitance between the loop and the soil surface. This capacitive coupling effect is again minimised by keeping the loop at least half a loop diameter or more above the ground.

The transformer analogy for the loop antenna is a good one. The HF communication link may be visualised as a reciprocal 'space transformer' with the loop acting as a secondary 'winding' loosely coupled to the distant transmitting antenna. The magnetic field component of the incident electromagnetic wave induces a small RF current to flow in the loop conductor by means of induction that in turn gets magnified by the loop resonator's high Q that is appropriately impedance matched to the coax transmission line.

A freestanding loop is best supported a metre or two in height on a short non-metallic mast section of 100 mm diameter PVC drainpipe and pedestal foot fashioned from plastic plumbing fittings. The loop can also be placed on a rotator drive and turned for best signal

strength or it can be oriented in angle to null-out particularly bad QRM.

Care must be taken not to touch the loop when transmitting and to keep a safe distance away from the loop's magnetic near-field to ensure conservative compliance with EMR standards for human exposure to EM fields. A distance equal to or greater than one or two loop diameters away is generally a safe field strength region. RF burns to the skin from touching the loop while transmitting are very unpleasant and take a long time to heal.

## Concluding remarks:

The proof of the pudding is always in the eating so experimentally inclined amateurs are encouraged to gain some first hand experience by getting into the shack and constructing some homebrew loops. Such empirical validation of efficacy is always very gratifying, particularly when a VK station can have a solid 5 and 9+ QSO on 20 m with a USA or Canadian station from an elegant looking Lilliputian indoor loop sitting on a table fed with a modest 50 Watts!

What we ultimately seek from any antenna is reliable HF communication at all times when a band is open for DX and, simply put, that means radiating most of the RF that is applied to the antenna in a useable direction and take-off angle.

The underestimated magnetic loop antenna satisfies that basic criteria very well.

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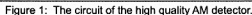
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# WICEN past, present and possible future

Jim Linton VK3PC\*

**The Victorian Emergency Management Act support agency WICEN (Vic) was prepared and trained for its deployments for the Black Saturday bushfire disaster, because of lessons learnt about its adaptability and capability some six years earlier.**

In January and February 2003 a fierce forest blaze, known as the Bogong fire in north-east Victoria burned uncontrolled for four weeks through more than one million hectares of land.

After a minimum of on-the-spot training, WICEN operators quickly became familiar with the Department of Sustainability and Environment (DSE) trunked radio networks and protocols. They were needed because the longevity of the fire had rapidly exhausted the DSE pool of operators.

This summer the DSE, which is responsible for fire response in publicly owned land such as national parks and reserves, requested WICEN operators being aware of this resource primarily as a result of the Bogong fire experience.

WICEN is listed in the Emergency Management Manual Victoria with the role of 'Provision of relief operators for other agency communications equipment.' That resulted in it being deployed to several centres.

Probably the busiest was the Incident Control Centre (ICC) at Alexandra in north-east Victoria where WICEN ran the radio systems as message handlers 24 hours a day with operator shifts of 12 hours.

Additionally WICEN provided communications between one of the worst fire affected areas, Kinglake, by setting up a radio link between it and the Shire of Murrindindi Municipal Emergency Coordinator Centre (MECC).

A vital role because the MECC is charged under the Emergency Management Act with responding to requests from emergency services for their resource and logistic needs.

WICEN operators also ran some Country Fire Authority (CFA) radio systems and demonstrated their flexibility and adaptability to handle its different protocols.

Since 2003 an emphasis has been placed on keeping WICEN operators

skilled in using the trunk radio system, which is different to conventional two-way radio as it requires pressing buttons to get the required station.

WICEN Victoria provided refresher training courses for its members in December last on that radio system. Indeed that was excellent forward planning! In fact training and accreditation of WICEN operators has been given a high priority over the years.

## Traditional role has faded

The role of radio amateurs to provide emergency communications in Australia began in the 1939 Black Friday fire disaster, and on later major occasions including Tropical Cyclone Tracy that hit Darwin in 1974, the Ash Wednesday fire disaster 1983, the Newcastle Earthquake 1989 and at time of floods.

On those occasions amateur radio mostly provided communications to fill the gap left when landline phones were knocked out, power had failed and emergency service radio systems overloaded.

This same traditional role was seen during the Indian Ocean Tsunami in 2004, the Great Sichuan Earthquake in China last year and after other emergencies around the world. A significant role continues to be played by amateur radio in other countries in establishing communication links after disasters.

In the mid-1980s and early 1990s WICEN could often provide superior communications to other services with the enhancement of the skills and operating knowledge of radio amateurs.

The Miller Inquiry into the Ash Wednesday disaster responded positively to the WICEN (Vic) submission on its role, which resulted in a strengthening of its reference in the State Disaster Plan (now the Emergency Management Act).

The Senate Standing Committee on Industry, Science, Technology, Transport, Communication and Infrastructure in 1994 said in part:

'WICEN is a volunteer group of radio amateurs with communications and information transfer skills and equipment. This organisation can be called upon by response and recovery agencies in the general community in times of emergency. WICEN's major role is the co-ordination of the response of the general amateur radio service in times of need.'

WICEN (Vic) has received many well deserved accolades, including one for its role in the lead up to the Millennium or Y2K bug on New Year's Eve 1999.

However in reality, communications technology and infrastructure has changed dramatically since the Ash Wednesday disaster with emergency and other services updating their systems and the arrival of the ubiquitous mobile phone.

Added to that is the policy of WICEN (Vic) to be a low profile organisation. That being in part due to the demands on it to provide cheap and reliable radio communications for sporting and other events, that it cannot meet.

But it may also have resulted in WICEN (Vic) *hiding its light under a bushel, or not blowing its trumpet loud enough* where it matters.

The fact is that circumstances have resulted in WICEN (Vic) not being in great demand in the past decade to carry out two of its functions under the Emergency Management Act that are:

Provision of communications or supplementary facilities for and between response and/or recovery agencies

Provision of communications to the community where conventional communications facilities are not available

The emergency response agencies are well geared up with their communications and there is a level of inter-operability that did not exist in 1983. Local Government



too has two-way radio systems that cover their municipalities.

The volunteer St John Ambulance is very well radio equipped and the Red Cross has its own RECOM communications arm. The Salvation Army, a range of government departments, Lions, Rotary and others involved in disaster recovery are well served by mobile phone.

Another change is that in 1983 prolonged periods without telephone service could be expected and there were no mobile phones. The major telco Telstra was quick to restore phone services this summer.

In an extraordinary and commendable display of customer service, Telstra used wireless technology including portable mobile phone cell towers, mustered 3,000 mobile phone chargers for bushfire victims and handed out mobile phones.

WICEN (Vic) did however have a role in providing personal communications for DSE strike teams at the McAdams Hill encampment near Matlock.

This was due to the capacity of the government radio system being required for essential fire fighting and logistical communications, and with no mobile phone coverage in the area WICEN

admirably facilitated health and welfare traffic for the crews.

Electricity supply companies also responded to the Black Saturday disaster by restoring power within relatively short timeframes.

After the Ash Wednesday disaster WICEN was involved in the clean-up after the fires providing communications support. However in 2009 government has decided on a different approach of using a contractor for that work.

This is due to occupational health and safety concerns with hazardous substances within the ruins of the fires including asbestos and treated pine.

WICEN (Vic), all state and territory based WICEN groups and those radio clubs that have picked up emergency communications capabilities, will most likely need to review their roles.

Also to be noted are the changes to International Radio Regulations Article 25 adopted at World Radiocommunication Conference 2003. These place a much greater emphasis on the amateur service preparing for and meeting communication needs in support of disaster relief.

In 2007 the WIA national board of

directors decided to take steps to improve the preparedness and capability of the amateur service in Australia to provide emergency communications. In a report to the WIA annual general meeting, its National WICEN Coordinator, Ewan Mcleod VK4ERM said that the WIA Board had decided that a new national network of emergency communications known as WIANNEC was needed.

This was to cover the wider Australasian Region and be in addition to, and complement the existing state and territory based WICEN capability. It has already resulted in Australia's regular participation in GlobalSET, a twice year world-wide simulated emergency test.

\* The author Jim Linton VK3PC has written about emergency communications by radio amateurs since 1974, was a member of the WICEN representation team appearing before the Miller Inquiry and for the past five years has been the Chairman of the IARU Region 3, Emergency Communications Committee.

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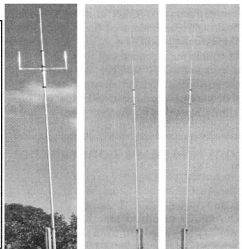
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POWER RATING	1 kW	1 kW	1 kW

# Fires out but more to do

Jim Linton VK3PC

**WICEN (Vic) had a total of 52 radio amateurs, including 36 WICEN members, deployed for 28 days in the mammoth response to the Black Saturday bushfire disaster.**

Backing up WICEN members were 16 other radio amateurs including two each from New South Wales and the Australian Capital Territory.

Secretary Mark Dods VK3XMU said the activation under the Emergency Management Act of Victoria began on Monday 9 February, only two days after Black Saturday and it ended on 9 March.

"It went as well as possibly could be expected and began smoothly after a bit of apprehension that having been put on standby, deployment was not immediate," said Mark VK3XMU.

"The deployment resulted in the equivalent of 223 person days that included those assigned to radio operating duties at Incident Control Centres (ICC), a Municipal Emergency Coordination Centre and elsewhere, plus running the WICEN (Vic) HF net duties."

He explained that the days service count includes 12 hour shifts at outer metropolitan Incident Control Centres and airbases (where firefighting aircraft were controlled), and 24 hour periods of deployment to other locations.

It also takes into account six days spent repairing WICEN and other infrastructure with some of that work still to be completed.

In putting out a general call for radio amateurs to assist it, WICEN was very clear in stating that the environment and demands of working in an Incident Control Centre was not for everyone.

Mark VK3XMU said, "Operators were expected to work efficiently and accurately despite noise and plenty of distractions as these nerve centres of disaster response are hectic to say the least."

Some of those involved brought with them invaluable experience from the January and February 2003 Bogong fire or the Ash Wednesday bushfire disaster of 1983.

He said, "Indeed, many members deployed during this activation became members after participating in the 1983 or 2003 activations."

"We hope that when we follow up non-members who were deployed for this activation we will have a similar burst of membership applications."

"It is obviously far easier for us to communicate with operators whose contact details are in our membership database, and members are also made aware of training opportunities such as Statnet Mobile Radio (SMR) and CFA 'Maintain Safety at an Incident' training."

But the voluntary work of WICEN (Vic) is far from over as it is to take part in debriefings involving the police, Country Fire Authority and the Department of Sustainability and Environment.

Mark VK3XMU had plenty of paperwork to handle during the deployment and that task is to continue for some time yet. Another role was looking after the welfare of those deployed.

He said, "All who were deployed had constant support, were encouraged to ring me at any time to talk about any matter or issue."

"The HF net on 80 metres maintained during the four weeks also gave them a link back to WICEN Administration and a share of information."

Mark VK3XMU said WICEN (Vic) expresses its thanks to those who volunteered to assist during this time of need, and also keeping the HF net frequency clear.

Well done to WICEN (Vic) in its voluntary contribution to the disaster response. The deployment for the disaster reconfirmed the role radio amateurs can play.

It also provides an opportunity to consider how things were done well and to identify room for improvement.

The same debriefing process is occurring in all emergency services and response agencies. Proposed changes are also anticipated through the recommendations from the Royal Commission into the bushfires.

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## The WIA Seeks Volunteers

The WIA needs help at its national office in Bayswater, Victoria.

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The devastating bushfires in Victoria

claimed some 173 lives, over 2000 homes were lost and more than 400,000 hectares of property affected. More than 7000 people were left homeless in the wake of Australia's most catastrophic bushfire on record.

Icom Australia would like to thank its dealers for all their amazing support, and wish those affected by the bushfires a safe and speedy return to their normal lives.

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# What do some amateur radio operators do in their spare time? Operate radio of course!

Arthur Greaves VK3FBEE

During the recent Victorian bush fires, this group of amateurs spent time in the St John Ambulance Headquarters Communications Centre.

St John Ambulance supplied 'First Aid' support into all areas affected by the fires. These 'First Aiders' were backed up by teams of people, who ensured they were supplied, relieved and looked after in the best possible way, all coordinated via the Communications Centre.

The Communications Centre was manned by St John communications specialists with assistance from others.

The group pictured share several common interests. All are amateurs, all are scouts, all are members of the Scout Radio and Electronic Service Unit, and two are St John volunteers.



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Left to right: Ben VK3HBN, Peter VK3ZPF, Greg VK3FUNK, an unidentified St John volunteer and Arthur VK3FBEE.

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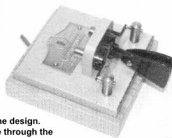
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# An Active Loop Receiving Antenna for 7 ~ 29 MHz

Drew Diamond VK3XU

In circumstances where it is impractical to erect a conventional antenna, or where local noise is a problem, a workable alternative is to use a small receiving antenna. Some experimenters favour either an un-tuned or broad-band voltage-probe (or 'whip'), while others prefer an un-tuned loop, either of these then followed by a broad-band amplifier to raise the signal level to near that obtained from a conventional antenna.

A disadvantage of broadband antennas is that, in addition to the wanted signal(s), a host of strong but unwanted out of band signals are also presented to the receiver's input. If the receiver's front-end signal handling ability (intermodulation and pre-selectivity) is less than very good, then various undesirable effects will almost certainly occur.

However, if the antenna is resonated at the receiving frequency, the natural selectivity of the circuit will greatly attenuate the strength of out-of-band signals before they are presented to the

front-end. Apart from positioning, the whip offers little discrimination against locally generated noise, whereas a tuned loop can usually be oriented to obtain a worthwhile, and often remarkable, improvement in signal-to-noise ratio (Reference 1).

Offered here are details of a simple tuned balanced loop antenna for sensitive listening between about 7 and 29 MHz (work is in-hand for a similar loop to cover 1.8~4 MHz). Internally generated noise is low, thus allowing sub-microvolt signals to be heard.

## Circuit

A two-turn, 320 mm diameter, 2.7 micro-Henry coil, made from aluminium strip, is resonated by a two-gang broadcast type variable capacitor between 7 and about 29 MHz. The frame of the capacitor is connected to chassis ground, thus forming a balanced tuned circuit, which ensures that the loop is predominately responsive to the magnetic component of the incoming wave (simple unbalanced circuits may respond slightly to the electric component also, thus skewing the null in direction-finding applications).

For an electrically (and physically) small antenna, a substantial amount of amplification is required to raise the signal level to a value similar to that obtained from a 'full-size' one. Initial pre-amplification is provided by a balanced (or push-pull) pair of ordinary 2N5484 FETs (Figure 1).

The job of interfacing between the drains of the FETs, and the unbalanced coax line to the receiver's input, is done with a 'long-tail' pair differential amplifier (References 2 and 3).

The discrete

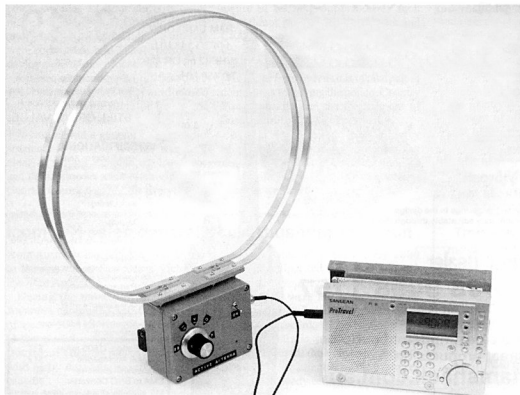


Photo 1: The active loop receiving antenna for 7 - 29 MHz in action.

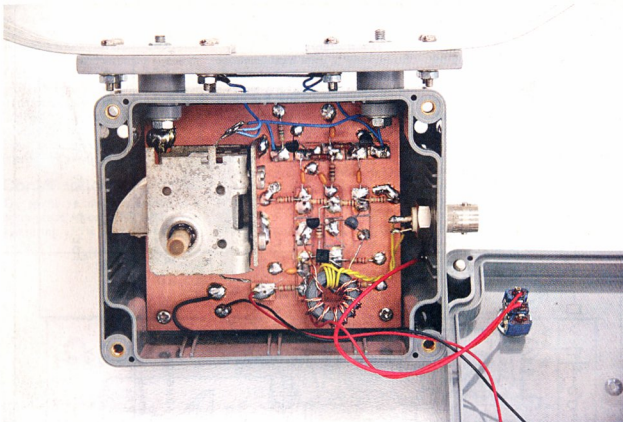


Photo 2: A view of the components mounted in the plastic box on the 'paddyboard' with the box lid removed.

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mounting holes, which are drilled after the loop has been nicely formed.

Your loop may be fitted to a 125 x 40 mm rectangle of ABS, Perspex or similar insulating material, secured with three mm screws and nuts, that is in turn mounted atop the plastic box in a manner similar to that pictured in Photo 1.

Fit solder lugs under the nuts at the end of each loop. Using a short length of hook-up wire, connect the end of one loop to the start of the other (marked 'b' upon the coil in Figure 1) to produce an inductance of 2.7 micro-Henry. The loop assembly may then be fixed to the box with two four mm screws and nuts. An insulated spacer (made from scraps of ABS) will be required on each screw at the interface.

The variable tuning capacitor, visible in Photo 2, is a small 400 + 400 pF dual-gang MSP part salvaged from an old Australian broadcast set. These are fairly common around the swap-meets. Or you could use a similarly ubiquitous Philips 450 + 450, or a Roblan 450 + 450 pF. It may be that your capacitor can be fitted so that the spindle emerges at the side of the box, rather than the front.

The broadband output coupling transformer may be made as follows. Take two 370 mm lengths of #22 B&S/0.6 mm ecw (enamelled covered wire), fix them, jointly, at one end in the jaws of a vice.

Twist the free ends together similarly, then clamp in the chuck of a hand-drill. Whilst maintaining a tension on the pair, crank the drill until you have about three twists per 10 mm. Now give the drill a firm pull to 'set' the bifilar pair. Carefully wind the pair on to a Jaycar LO-1230, or an Amidon FT50-43 toroid - about 10 loops should fit nicely, leaving a gap for the four-turn hook-up wire link (s)secondary winding.

With a multimeter set to read ohms, identify the two (p)primary windings, then connect the end of one to the start (dot) of the other, to form the centre tap (ct).

The six volt battery of four AA cells may be accommodated in a holder, such as the Jaycar PH-9204. It can be attached to the lower outside surface of the box with small screws and nuts, or simply fixed there with hot-melt glue. The LED is fitted into the front panel to serve as an 'on' and battery condition indicator.

## Operation

Inspect your wiring and soldering for quality and accuracy. Confirm that the FETs and transistors are correctly fitted, and that your battery of AA cells is properly installed.

Connect the amplifier output to the receiver input using any reasonable length of 50 ohm coax cable. Switch on, then carefully adjust the variable capacitor for a peak in noise and/or signals.

If the band is in fair to good shape, the combo should sound quite lively. Any local noise or interfering signals should be reducible by careful rotation of the loop's plane.

My loop has been tested in all sorts of typical locations (some of them quite noisy) during our travels. It provides (perhaps surprisingly) good performance indoors.

However, at a distance from electric power lines and appliances, a portable receiver/loop combo gives excellent results. For receivers that have a DX/local switch (such as the popular Sangean and Degen sets), it should be found that the DX position is seldom required (thus giving better strong-signal handling).

As long as a reasonable separation is maintained between a transmitting antenna and loop, no damage should be caused to the amplifier or receiver. However, an accidental transmission into the output of the loop amplifier would be a different story!

Counter-intuitively, perhaps, the null is through the axis of the loop (that is, when the loop is 'broad-side on', see Reference 1).

A suggested circuit is included in Figure 1 to provide 'phantom' power for remote operation.

## Parts

All the ordinary components are available from our usual parts suppliers, including Altronics, Electronic World, Jaycar, Rockby and Semtronics.

Sources of aluminium strip for the antenna loop coil, ABS Box, toroidal core and variable capacitor are mentioned in 'Construction' above.

You may well find (as is the case in nearby Ringwood) that off-cuts of ABS (and Perspex/acrylic) sheet is available from the scrap-box of your local plastic sign maker, free for the asking.

I am not in the parts business. Nevertheless, if, after earnest efforts, one or two items remain elusive, do 'phone me on 03 9722 1620, or drop me a line, as it may well be that I have spares on hand.

## References and Further Reading

1. "Small Loop Receiving Antennas"; Joseph Carr, Electronics World, November 2000.
2. The Art of Electronics, 2nd edition; pp 98 ~ 104, Horowitz & Hill, Cambridge University Press.
3. Experimental Methods in RF Design: pp 2.16 ~ 2.18 (excellent), Wes Hayward et al, ARRL.
4. "'Paddyboard' Circuit Construction - Revised", Amateur Radio, May 2005.

Photos by Andrew Diamond

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## A VK3ZRX short story

# Dangerous Capacitors

John Morrissey VK3ZRX

Some years ago, there were a number of house fires caused by the Mistral Gyro-Aire fan, which was housed in a distinctive square plastic casing. I recall we had one of these, and that it too started to smoke.

On investigation I found that one of the capacitors in the electronic speed control unit had failed. The capacitor concerned was branded "AEE Miniprint" and I have since seen many of these fail over the years. My strong recommendation is that if you ever come across these in equipment, replace them immediately! They have a distinctive appearance, being encapsulated in a clear (or slightly yellowish to amber) coloured moulded resin which usually cracks with time. They appear to have been moulded rather than dipped.

In the past couple of weeks I have become the proud owner of a Hewlett Packard 8640B signal generator. When first powered up, it had distinct burning smells, but I was unable to find the source. I assumed that a tantalum power supply bypass capacitor (of which there are lots) had gone to tantalum heaven and that it had eventually failed open circuit. However after a couple of weeks, I needed to do repairs to the bandswitch/deviation switch assembly (a generic 8640A/B fault, but that is another story). With repairs completed, I turned the box over and it rattled - although I was sure I had not dropped anything. Sure enough, I found a piece of moulded plastic which looked suspiciously like part of one of the Miniprint type capacitors.

After a bit more searching I found it - buried in the mains input RFI filter assembly. It had failed in spectacular fashion, fortunately without setting fire to anything else. However this was not an AEE Miniprint - it was another brand, although in exactly the same moulded case.

The conclusion is that any of the capacitors with this construction should be regarded as suspect. They are commonly used as 240 V AC bypasses.

Also, anyone with an HP8640 A or B should investigate these caps as a matter of urgency. They are designated C6 on the power supply schematic, and are located at the rear of the power input socket - reasonably easy to get to once the socket is unclipped and withdrawn out of the back of the case. The capacitor is upstream of the power switch, so is always live and waiting to fail.

Even if you own other HP gear of this vintage (1970s), it would be worthwhile to check, as the capacitors may also have been used in other equipment.

ar

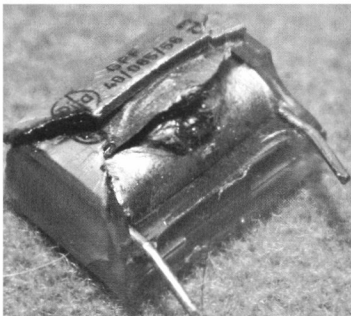


Photo 1 Front view of the faulty cap (you can just make out the brand name (RIFA)).

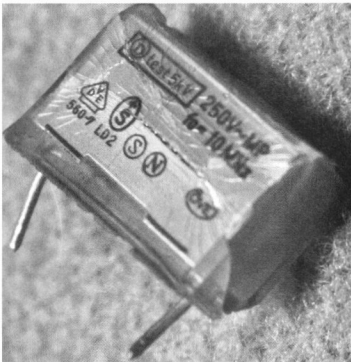


Photo 2 Rear view of the faulty cap.

## Review

# The Icom IC-7200 HF and 6 m 100 watt transceiver

Bill Roper VK3BR and Ron Fisher VK3OM

The IC-7200 is a compact (241 x 84 x 281 mm – 5.5 kg in weight) HF and 6 metre, DSP, 100 watt (variable down to 2 watts) output transceiver on SSB, CW, AM (25 watts output only on AM), RTTY, FSK, and SSTV/PSK31, but with no FM facility. It is a triple conversion radio, the first IF is at 64.455 MHz, a second IF at 455 kHz and the third IF at 15.625 kHz where the DSP circuitry operates.

Although it is compact, it does not seem entirely suitable for mobile operation, even though a mobile mounting bracket (MB-118) is available as an optional extra. However, it is ideal for portable and field day operation, as well as for the compact home shack.

Although the IC-7200 is not water proof, the construction methods that are used in Icom's marine radios are applied to the buttons and knobs on the front panel to provide a measure of protection against water intrusion.

Even though the IC-7200 could be classed as an entry level transceiver, its advanced digital features are comparable with those in many higher class transceivers. For instance, it has IF DSP providing a wide choice of receive bandwidths, very effective digital twin pass-band tuning, a superb manual notch filter (up to 70 dB attenuation) as well as an automatic digital notch filter, excellent digital noise reduction in addition to a noise blanker, and an RF speech compressor.

As can be seen from the photo of the front panel, the IC-7200 has followed what seems to be the current fashion in amateur transceivers in having black knobs and buttons on a black background. Fortunately, the various controls are clearly lettered. Also, for such a small front panel, which also includes a speaker, the controls are a good size and well spaced. This is because there are

fewer front panel controls than would be normal for such a complex little rig, which is a result of most controls and buttons having multiple functions. More about that later.

The IC-7200 conveys the solidity of a military mobile radio set. We found the overall feel of the main tuning knob and other controls to be smooth and pleasant. The rugged construction of the case and the front panel, with the positive feel of the Neoprene push buttons, adds to this impression of a very solid rig.

The main tuning knob, with its chunky synthetic rubber grip, has a very smooth feel with no apparent side-play. The other rotary controls also have a positive and comfortable feel, particularly the large, concentric twin PBT (pass-band-tuning) knobs. The centre detent enables setting the twin PBT knobs to the neutral position.

This solidly constructed transceiver



Photo 1: A front panel view of the IC-7200 propped up on the supplied bail. The HM-36 hand microphone that comes with the radio gives an indication of the compact size of the transceiver.



has a rear bumper which protects the rear-panel connectors and heat-dissipator fins. Optional front handles (MB-116) will protect the front panel and its controls from accidental damage. A side carry handle (MB-117) is also available as an option.

# Front panel and features

Although the IC-7200's monochrome (black on an amber background) LCD display is relatively small (64 x 24 mm), we found it sharp, and very legible, even to our aging eyes. Contrast was more than sufficient for comfortable viewing in bright light. The backlight settings are high, low and off. High, which is quite bright, is the default. Filter selections and feature activation are displayed via on-screen icons. Although some of these are rather small, we found them quite readable.

A very useful aid is the voice synthesizer, which is a standard feature. This function, at the push of the SPCH button alongside the On/Off button, announces the S-meter level, operating frequency and mode (the S-meter level announcement can be deactivated) in a very clear, electronically generated voice, in English. Only a quick push on the button is required. We found that if we pushed the button for any length of time it activated the controls Lock mode, and not the voice synthesizer.

A feature of the front is the inbuilt speaker. Although a small unit, the quality of received voice transmissions is surprisingly good. Obviously the frequency response of the speaker has been carefully optimised to the receive characteristics of the transceiver. Although the quality of AM broadcast station reception was quite good on this inbuilt speaker, quality can be improved by plugging in a larger external speaker.

As mentioned above, the main tuning knob has a very smooth action. Programmable tuning steps are available to suit your operating requirements. These are selectable from 0.1, 1, 5, 9 and 10 kHz tuning steps when rotating the tuning knob. When the 1 Hz step is selected, the 1 Hz digit appears in the frequency readout; when the 10 Hz step is selected, the 1 Hz digit disappears from the frequency indication. Turning the knob faster increases the tuning rate, which is a particular boon when using the 1 Hz tuning step rate.

The IC-7200 uses a high stability TXCO (+/- 0.5 ppm), and twin A and B VFOs are selectable with the A/B button. Multiple band-stacking for each band, a feature of other Icom radios, is not available. Single band-stacking is used, however, which means that each time you return to a band,



Photo 2: A view of the rear panel of the IC-7200 with the PSU cable plugged in. The connection to the external ATU is to the left of the power plug; the USB connector is to the left of the Remote and External Speaker jacks.

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it will show the last frequency used on that band as well as the mode.

Most of the front-panel buttons have secondary functions which are accessed by pressing and holding the button for one second. The digit-entry function of the numerical buttons is a secondary function, and is entered by first pressing the F-INP key. The yellow numerical digits are a clue to this, as the F-INP marking is in yellow. The secondary BAND (band-selection) function of the F-INP key is marked in white, in keeping with the band markings on the numerical buttons. Obviously band selection is the tertiary function of these buttons. This may sound confusing, but the process becomes intuitive very quickly, although it takes a while to get used to pressing two buttons to change bands.

The IC-7200 has 201 memory channels, 1-199 for regular memory channels, and P1 and P2 for scan edge memory channels. Each regular memory channel shows a frequency and operating mode like a VFO. Even if the frequency or mode is changed, the memory channel does not memorise the new frequency or operating mode. When the memory channel is selected from another memory channel or VFO mode, the memorised frequency and operating mode appear even if the memory channel settings, frequency and mode, are changed before selecting another memory channel

or VFO mode. A memory channel's frequency and mode can be transferred to a VFO while in the memory mode.

The memory scan can be set to pause for 10 seconds when detecting a signal, and then resume the scan. When a signal disappears while the scan is paused, the scan resumes two seconds later.

The SET menu, familiar to other Icom DSP radio users, has two levels, accessible by pressing and holding the M-CH/RIT button. Press and hold once to enter the QUICK SET menu (transmit power output, MIC Gain, etc). Press and hold again to enter the in-depth SET menu. The MCH/RIT button is also an EXIT key. Similarly, M-CL restores a selected parameter to its default value.

The RIT function shifts the receive frequency up to  $\pm 9,999$  kHz in 1 Hz steps (10 Hz steps when the 1 Hz step readout is cancelled) without moving the transmit frequency.

At first, we found RIT activation confusing. To change the M-CH/RIT control to RIT, the RIT button must first be pressed to activate RIT. The M-CH/RIT knob will switch to RIT automatically when RIT is active (RIT icon displayed). When first pushed the shift frequency is indicated for about one second. Similarly, when changing the RIT frequency by turning the M-CH/RIT knob, the shift frequency is displayed. A few attempts to use the RIT function while

following the User Manual will unravel the complexities of RIT operation.

There is no doubt the RIT function is very useful and the initial confusing complexity of using this feature is a by-product of multi-function buttons.

The receive filter selection and adjustment procedure is similar to that of other Icom DSP radios. You press and hold the FILTER button for one second to adjust the filter bandwidth between Sharp and Soft. Quick presses of the FILTER button changes the filters to Wide, Middle or Narrow.

The filter bandwidths, which are continuously variable, are different for the various modes. On SSB the filter bandwidths are variable from 50 Hz up to 500 Hz in 50 Hz steps, then up to 3.6 kHz in 100 Hz steps. On AM they are variable from 200 Hz to 8 kHz in 200 Hz steps; and on RTTY they are variable from 50 Hz to 500 Hz in 50 Hz steps and then in 100 Hz steps up to 2.7 kHz.

The default settings for SSB are 3.6 kHz in Wide, 2.4 kHz in Middle and 1.8 kHz in Narrow.

Of course, the selectivity of the DSP filters can be enhanced by use of the twin Pass-Band-Tuning controls. The general PBT function electronically narrows the IF pass-band width by shifting the IF frequency slightly outside the IF filter pass-band to reject interference. The IC-7200 uses DSP for the PBT function. By rotating both TWIN PBT controls (inner/outer - PBT1 and PBT2) together, the PBT functions as an IF shift control. The limit of the variable range depends on the pass-band width and mode. The limit of the variable range is half of the pass-band width, and PBT is adjustable in 200 Hz (AM) or 50 Hz (other modes) steps.

The CW Pitch control is a QUICK SET menu item, rather than a separate control. The received CW audio pitch and monitored CW audio pitch can be adjusted to suit your preferences from 300 to 900 Hz in 10 Hz steps without changing the operating frequency.

Pressing the P.AMP/ATT button turns on the receiver preamplifier to improve the S/N ratio and sensitivity when receiving weak signals. Pressing and holding the P.AMP/ATT button for one second inserts a 20 dB attenuator in the RF signal path, in place of the preamplifier, to minimise very strong signals near the desired frequency from causing distortion of a received signal.

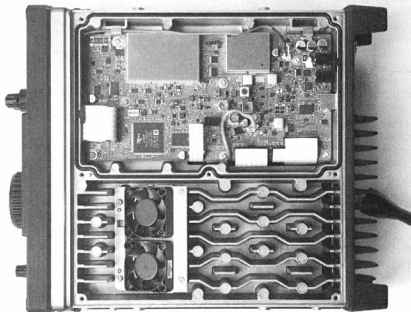


Photo 3: A view inside the top of the IC-7200 clearly showing the twin cooling fans and the extensive cooling fins and ducting.

The tuneable Manual Notch Filter is inside the AGC loop, and is extremely effective with a stop-band attenuation of at least 70 dB. The MNF has three width settings (Wide, Mid and Narrow). The manual notch suppresses an interfering carrier before it can stimulate AGC action, thus preventing swamping of the AGC by an adjacent notched signal.

The Automatic Notch Filter is post-AGC. It suppresses single and multiple tones, but strong undesired signals can still cause AGC action and swamp the receiver. The MNF and the ANF are mutually exclusive. The ANF is inoperative in the CW mode.

We found the DSP Noise Reduction function to work very well in a normal, noisy suburban location. On SSB the maximum noise reduction occurs at a level setting between 6 and 10 (maximum setting is level 15). As the noise reduction level is increased, there is some loss of highs in the received audio as well as a drop in audio level, as would be expected with digital noise reduction. Also, as the level is moved higher than about 6, the received audio seems to take on a hollow sound. However, in our use of the transceiver for normal SSB operation, the NR was switched in all the time.

We also found the DSP Noise Blanker to be somewhat more effective than the usual analogue noise blanker used in many other transceivers. It will strongly attenuate fast-rising noise pulses, but is less effective on power-line hash. The NB worked noticeably better when used in conjunction with the digital noise reduction.

Metering is provided by a bar graph in the bottom right hand corner of the digital display. In receive the bar graph acts as an S meter from S1 to S9 plus 20, 40 and 60 dB over S9. Three selectable transmit meter scales are provided – PO (RF output), ALC and SWR, but only one is in operation at a time. You hold the ANF/METER button for one second each time to toggle between the three transmit functions.

The IC-7200 has only two transmit audio menu items, Mic Gain and compression level. The DSP IF-level compressor is similar to that provided on other Icom DSP radios. It works very smoothly, and does not distort at the default compression level value of 5 (approximately 6 dB compression).

The US version of the IC-7200 operates

on the US 60 m band. We understand that, in order to ensure FCC compliance on 60 m, no transmit bandwidth or equalization menus are provided, even on the version of the IC-7200 being sold in Australia without 60 m capability. This lack of ability to vary the transmit audio characteristics is unfortunate. Using the standard Icom HM-36 hand microphone, the reviewers found the transmit audio to be quite bassy and lacking in high frequencies.

However, when not doing a comparison check of the IC-7200's transmit audio quality against another transceiver, it must be admitted that in many QSOs on-air other amateurs said that the IC-7200 audio was easy to copy.

We understand from other sources that substituting another microphone, such as the Heil GM-5 microphone, can change the transmit audio characteristics considerably for the better.

Incidentally, one of the features not included in the IC-7200 is a transmit audio monitor.

## Back panel

The rear panel of the IC-7200 is uncluttered and provides many of the usual transceiver interfaces including connections to an Icom automatic antenna tuner, the Icom IC-PW1 1 kW solid-state linear amplifier, as well as relay and ALC connections for a non-Icom linear amplifier. Also included are connections to a CW key, an external speaker, the very solid DC lead, three metres long fitted with the now standard four-pin connector and two plug-in fuses and, of course, the antenna.

Another connection on the IC-7200 rear-panel is a USB port enabling the radio to be directly connected to a laptop or other PC via a standard USB cable. The USB port transports not only CI-V data, but also Tx and Rx PCM baseband between the IC-7200 and the computer. As a result, the USB cable is the only radio/PC connection required. For those interested in connecting their IC-7200 transceiver to their computer, for example to be able to view PSK31 and RTTY traffic and waterfalls, the Icom USB drivers are downloadable from the Icom Japan world-wide support site.

All back panel connections are indicated with raised lettering (see the photo of the rear panel).

## On the air

It is a simple procedure to get the IC-7200 on-air; simply connect up a suitable antenna and PSU. The PSU requirements are 22 amps at 13.8 volts on full power transmit and only 1.3 amps on receive. The new standard four pin power connector is used, which the reviewers once again found very difficult to disconnect from the transceiver until we read the instruction manual!

As mentioned previously, changing bands is a little more complicated than on most transceivers. However, once the procedure is understood, it is quite straight forward.

The audio quality on receive from the small internal speaker is surprisingly good, very much better than we expected. One of the receive audio checks we make on reviewed rigs is to check audio quality on AM broadcast reception. Many transceivers reviewed in the past have been quite disappointing in this respect. However, AM reception on the IC-7200 was excellent, but intriguingly was better on the 6 kHz bandwidth reception than on the 8 kHz bandwidth reception.

Even though the audio from the inbuilt speaker was very good, nevertheless, as expected, the audio from a good quality external speaker was even better.

All in all, despite the small size of the transceiver, it was a delight to use once we became familiar with the multi-function controls.

We were favourably impressed by the IC-7200's solid construction (even though the appearance is metallic, the case is made from plastic). We were also impressed with the smooth operating feel of the transceiver, its impressive array of features and its good on-air performance. This is a lot of radio in a compact package.

We can thoroughly recommend the IC-7200 transceiver as a worthy addition to the comprehensive Icom range of transceivers. It is very good value for money.

The recommended retail price of the IC-7200 is around \$1,750, but may be available cheaper by shopping around.

A number of accessories are available, including external automatic ATUs, a carrying handle and front panel handles, etc. Consult your local Icom dealer for more details.

All photos by Bill Roper VK3BR.

# Off Centre Fed dipole (OCF)

Ron VK3AFW

Ron VK2DQ is to be congratulated on his excellent article on the OCF dipole (AR Jan-Feb 2009) and the baluns he used. There are three points on which I would like to comment.

Yes the wire is a feed line.

The single wire feed line has been credited to Frank Conrad 8XX of Westinghouse. Major General Loren G Windom published comments on adjusting an OCF antenna in QST in July 1926 and in QST Sept 1929 published an improved design. It was stated by him to be a description of work done by two students Everitt and Byrne in his faculty. The first use of the name "Windom" appears to be by the Wireless Institute of Australia which in 1930 published an article which was substantially a reprint of Windom's QST article.

A single wire parallel to the ground provides a feed line with a characteristic impedance between about 100 and 400 ohms depending on its height above ground. The earth forms one part of the transmission line and the wire the other part. If the wire slopes then it no longer has constant impedance. The section nearer the ground has a lower impedance and the higher part a higher impedance. This means that it will have a standing wave due to mismatch no matter whether it is terminated in its characteristic impedance at the matching port or terminated by some other resistive load. The VSWR when connected to a Windom will typically be in the region 2:1 to 5:1 at resonance. This is acceptable for a wire transmission line.

So Windom was able to feed his half wave dipole with a single wire and get much of his transmitter's power to be radiated by the horizontal section. His 40 m signal was said to be outstanding.

There is no doubt that the wire feeder will radiate maybe 25% of the power it is fed and that this will be largely vertically polarized.

By bringing the feeder away from the antenna at right angles for a respectable distance the problems of noise pick-up, excessive feeder radiation and interaction of the radiation patterns could be kept within acceptable bounds.

The quarter wave mentioned seems to have gained currency for no good reason. A greater distance would be better.

Of course these days we can avoid the

radiation from the feeder by using a coax feed and a balun, but neither existed in the 1920s. It also means that the feed line can be any length without much consideration of possible interactions with the dipole or the environment, providing it runs at right angles to the dipole for a reasonable distance (a quarter wave maybe?).

The second point is that contrary to what is said by many the antenna does not resonate at exact even multiples of the fundamental resonant frequency.

Due to the "end effect", the 40 m resonance for example occurs higher than twice the 80 m frequency. This can be explained as follows:

The 80 m resonance is reduced by about 5% over the theoretical free space length based on an infinitely thin conductor. On 40 m the antenna is two half waves, and the two "ends" of the half wave that occur along the dipole are unaffected by end effect, so the 5% frequency reduction does not apply. The ARRL "Handbook" (p 595, 1977 Ed) gives a formula as follows:

$$F = 150 * (N - 0.05) / L$$
where F is the resonant frequency in MHz, N is the number of half waves and L is the dipole length in metres. (I have made the conversion from feet to metres for this letter).

If the 80 m resonance is on 3.60 MHz,

then the even harmonics are actually: 7.58, 15.16, 22.74 and 30.31 MHz. I have found the ARRL formula to be pretty close to what happens in practice. These numbers also agree well with an antenna simulation software program that I have run in the past.

Adding capacitance hats to the dipole at the voltage peak point for 40 m will help on this band but additional capacitance hats will be required for all voltage peaks on each band, making the antenna more complex to build.

The use of an ATU cannot be avoided except perhaps on one band.

Finally, the feed impedance may be about half the figures given by Ron if the dipole is in an inverted vee configuration. I have also found that at an average height of 10 m the feed resistance at resonance for the 1/3 tap point varies from around 100 to 200 ohms. This has been checked by both simulation and measurement. One author suggests using an 80/20 tap position so that 30 m presents a useable VSWR. I have not investigated this suggestion.

While there is no simple cheap antenna that gives fantastic performance on all HF bands, Carolina Windom included, the OCF does a commendable job on three bands. The SWR etc will be dependent on any variations in the design and the actual installation details.

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## South East Radio Club 2009 Convention

June 6th and 7th long weekend

### Australian Fox Hunting Championship

Tea, coffee, hamburgers and soft drinks for sale

Commercial displays Pre-loved radios

Home Brew Contest Massive lucky door prizes Raffle

Please note: doors open at 13:00 Saturday

For more information phone Wayne or log onto our web site and follow the links to the convention pages.

<http://serg.mountgambier.org/>

For info or table bookings contact Wayne VK5ZX on

(08) 87254335 or 0407 718908

# John Moyle Memorial National Field Day

Clubs all over Australia take to the field for the JMMNFD. Here are some of the reports.

## WANSARC

### John Moyle Memorial National Field Day

John Joseph Karr VK3FMPB

It has not rained properly in Melbourne for ages. WANSARC members go into the field for only two days in a year, our family day at Bundoora and now the John Moyle competition, and it rains on both events. If we extrapolate that we could say that WANSARC has the answer to the drought. Attempt to hold a field day or family day and just watch the skies open up. Could that be the answer, run field days every weekend until our dams are full again?

Of course, amateur radio, saving Melbourne one rainy weekend at a time.

The skies looked foreboding as if telling us of the impending storm. Did we take any notice? No. Did anyone see the storm clouds to the west? Nah. We just put our heads down and our bums up and we build on regardless.

We arrived at our clandestine QTH from about 0800 and people just kept on rolling up until about 1000. That was on top of a few keen members who spent the night here.

As I look out of the window of my temporary office. I can see people busily setting up towers, verticals, beams, long wire antennas, more beams and another mast as well. Personnel present on the day were VK3s VCL, EL, NE, MRT, FTDX, EB, DWH, ZO, DKM, NQ, FJPM, HDX, PI, FY, FNIK and yours truly, VK3FMPB.

14 members on different bands, the sun did not stop us last time and the rain would not stop us this time. We hope. Some of the bands we contested on were 23 cm, 70 cm, 2 m, 6 m, 10 m, 20 m, 40 m, 80 m and 160 m. If you really want the points you have to put the effort in. We are one club who is not afraid to put that effort in.

We employed a rotational system of operating masterminded by Wayne

VCL. Keep the troops fresh and keep 'em keen.

The weather was with us when we arrived then it turned against us and again later, with us. Oh, it is Melbourne, this happens all the time. That necessitated two changes of clothes for some of us. It got pretty cold at times. Then it got warm. Then it got cold again.

The contest seemed to be going ok with most of our stations making contacts and scoring points for WANSARC.

The troops working the radios seem to be happy little Vegemites and everybody seems to be making contacts. The weather has belatedly fined up and all is well at WANSARC.

Our operators seem to be doing well. Mark PI's voice is heard booming out over portable radios on people's belt buckles all over the camp site.

Lunch time and Rod VK3MRT mans the BBQ and turns out some lovely snags and burgers, add coleslaw to that and you have a nice lunch. After that you have seconds and thirds and our next family day will be at a weight loss centre. VK3TOOFAT!!

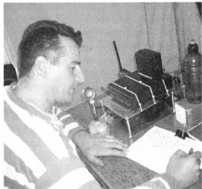
One factor that is definitely noticeable is the spirit of co-operation among the more than a dozen members present. Different people take different tasks like cooking, cleaning, entering data into computers, manning the different radio stations. Helping each other where we can: a co-operative effort on John Moyle Field Day 2009 from WANSARC members. That is what we do: "Teamwork".

As the day wears on, new stations come on to the airwaves. We pounce on them. We try new antenna configurations, beams on 2 m, beams on HF.

Another important job on John Moyle day, at least as important as the talking, is to log all the contacts we make, or the work we have done or it all comes to naught. Rod MRT is on charge of that job. Rod sits at his computer logging entries as they come in, and that is no mean feat. With five or more stations



President VK3NE operating from his car.



Frank VK3ZO operating on HF.



VK3MRT inputting the data from log sheets onto the computer logs.

operating it means the forms come in hard and fast. Especially at the end of a 3-hour period when all stations arrive with forms in hand at the same time. There must be a better way to do it than that.

Another meal at 1730 and we have finished the food quota for the day. Thanks Trevor and Rod.

The last session of the day was from 1800 onwards. We make plans to do a last session but the weather has different ideas. It was been cold for most of the day but now the weather is really starting to get nasty. The wind has blown up a mini gale and we have tents and masts falling over and being pulled down for safety's sake. The rain has whipped up anew and it becoming quite cold and uncomfortable at our QTH. The black clouds are rolling in over the top of us and the wind seems to be getting stronger. It all seems a bit dangerous now.

Masts high in the sky seem shaky especially as some have four or more antennas on them. We had about four or five masts up on the day. Thankfully at WANSARC we know a thing or two about construction and safety and not a mishap or injury was had on the day. That is not to say it was not a little frightening in the middle of that gale.

An executive decision is made by VK3NE to abandon the competition in favour of safety. Pull 'em down he yells, hardly being able to be heard over the wind and rain.

People, men, start dismantling their radio stations. Guy wires come down as did masts and antennas simultaneously all over the area. What took us most of the morning to erect took us 30 minutes to dismantle.

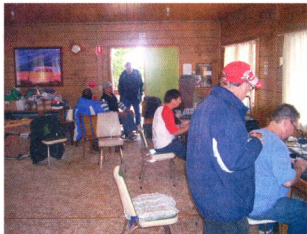
Trevor's (FTDX) mast and HF beam is proving to be a handful, get a few blokes over to him, quick.

Graham NE starts pulling his mast down but it is also proving to be a handful. At least it is bolted to his trailer. Four blokes helping him makes it possible to do that safely however. As I mentioned previously teamwork is what we do. All down and safety is restored, the wind even died down for us.

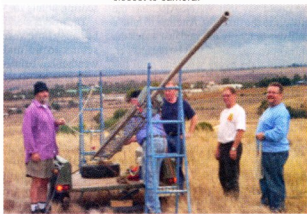
Time to debrief and a final chat and we are all finished. Thankfully.

Cheers John VK3FMPB WANSARC

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The nerve centre being used half capacity. L to R: Trevor VK3FTYDX, Frank VK3ZO, Bob VK3EL in door way, Victor, Dan (standing), VK3DWH and Rod VK3MRT on computer closest to camera.



Is that a mast or a Bazooka? VKs 3 EB, EI, VCL, DWH, MRT either attempting to lob one into enemy territory or putting up a mast.

## Redcliffe Radio Club VK4IZ at the John Moyle Memorial National Field Day Contest

Mal Smith VK4UMS

The Redcliffe Radio Club (RRC) competes in the John Moyle Memorial National Field Day contest under the call sign of VK4IZ at the picturesque bush setting of Murrumbong Scout Campsite located about 40 km north of Brisbane

The RRC uses this annual contest weekend as a recreational activity, operator skills development camp, training for emergency operations (WICEN and SES) as well as instruction training and running exams for new licensees. Practice makes perfect so they say, and the contact count rose from 920 in 2008 to 1225 this year including Morse.

The RRC has a very diverse spread of member occupations from the electrical and building trades, medicine, engineering, law and of course, the grey nomads. All members bring their lifestyle and work skills and disciplines to the club activities.

The week before there was a meeting where all club members and committee reviewed the plans and organised the shipment and setup of the site.

On the Friday, some of the club members are able to pack up the equipment and set up ready for the weekend. John

VK4YJV brought out his large crane truck and attached the 20 m monoband Yagi to the boom and was able to swing up the assembly by the flick of a lever to about 10 m ..... and it was secure. There was a slight problem as to which end was which and where it was pointing. A piece of cloth was tied to the pointy end and the controller relocated next to the door so you could see what you were doing, just too easy.

Running radio transceivers and related electrical and infrastructure to support six transceiving stations and 60 people is a significant undertaking under simulated disaster conditions. There is a lot of organisation and hard work to ensure that the whole system is comprehensive and very reliable. The club team Andy VK4KY, Peter VK4EA, Glen VK4FZ, Peter VK4TAA and many more who worked very hard to collate, test and ship the equipment, food and facilities to the site at Murrumbong.

This year the RRC used large 12 V 200 Ah SLAs as the primary source of power with regulated power supplies being



used to top up and maintain full charge. The power supplies were fed by long power cables to a standard or inverter generator power supply. Most of the lighting was high efficiency LED strings and low voltage fluorescent lamps. The “UPS” approach meant that generators could be refuelled safely and there was no need to run them continuously as well as preventing the unexpected blackout if a generator failed.

There were issues with interference from the inverter generator, 12/240 inverters and 12 V lamps. Special filters were built to reduce noise from inverter generators and appropriate usage and location resolved other sources of electrical hash. This year a special notch filter was built on the 40 m rig to minimise the 3rd harmonic with the 15 m band.

The number of contacts was well up on last year and included a reasonable number of CW contacts in the totals.

Band	Contacts	Antenna	Power	Equipment.
160 m	20	mono dipole	100 W	K3
80 m	256	mono dipole	300 W	Icom IC-756
40 m	516	mono dipole	300 W	Icom IC-718
20 m	333	dipole and Yagi	300 W	Icom IC-718
15 m	63	mono dipole	300 W	Icom IC-718
10 m	37	Stationmaster	300 W	Icom IC-718

Peter VK4EA had some APRS and packet equipment on site as well as a Yaseu FT-817 where some non contest activities were undertaken with 4FY.

It was a relaxed atmosphere where learning and amateur assessments were conducted. Our youngest member Nicholas O’Sullivan was undergoing training and examination during the weekend. He passed all components and now he has a callsign of his own. He appeared in a segment of Extra.

Direct Hire supplied portable toilets on site and access to showers .... very important for XYLS and their families. Peter VK4EA was the camp oven champion and we all sat down to a magnificent roast lamb or pork with a selection of roasted and steamed vegetables on the Saturday night.

Everyone enjoyed a marvellous experience camping, learning more about our hobby and playing radio. The Monday after the RRC had a debriefing session and notes were taken to deal with shortcomings and improve the experience for the next weekend away. The chairman and his committee extend their congratulations and thanks to all who contributed to the smooth running of the weekend.

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Nicholas setting up.



The tents set up as radio rooms



The assessment team at work. Ray VK4CF, Chris VK4ANI and Scott Meredith, who has now completed his Foundation assessment.



Peter VK4EA cooking dinner

# ADELAIDE HILLS AMATEUR RADIO SOCIETY

Christine Taylor VK5CTY

**Ten AHARS members competed in the 2009 JMMNFD in kinder weather but more unkind propagation than last year**

March was a busy month for AHARS. Over the weekend of 7th/8th ten members participated in the John Moyle Memorial Field Day at the venue we have used for a number of years, even though it is now under new ownership.

Robert VK5ZHW and Tina VK5TMC were very glad the weather, this year, allowed us to run VK5BAR for AHARS at Womeroo, near Swan Reach. If you remember, last year VK5 was in the middle of a solid fortnight of maximum temperatures over 40°C on the weekend of the JMMFD.

This year the weather was almost perfect. Unfortunately propagation was not as good as it has sometimes been, but neither was it impossible.

We had stations on 20, 40 and 80 metres and tried for contacts on 15 and 10 metres, and, on the Sunday morning we put out calls on 160 metres, on which we have managed a few contacts in other years, without success, even though we could hear the Sunday morning broadcast on that band. Please listen out next year, any members who use 160 on Sunday mornings.

For Richard VK5ZNC, the new Treasurer of AHARS it was his first ever contest and almost his first ever experience of HF. For his XYL, Sue VK5AYL this was the first time in many years she had used HF although she had, at one stage, used it regularly.

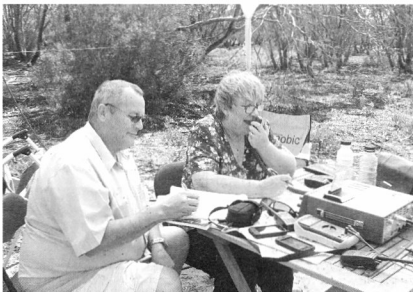
Several new antennas were tried out this year with success. Several were tested against each other and at one location two different rigs were tested with the same aerial. The spirit of the Field Day was followed.

It is possible that there were fewer stations on the air this year because many amateurs had used their field day skills seriously during the terrible VK3 bushfires. They did not need to practise!

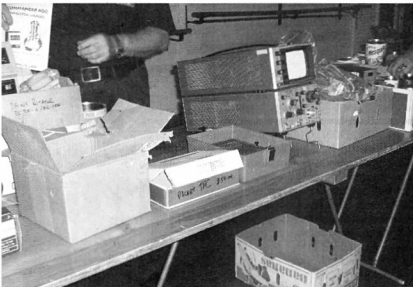
The March meeting was the usual Members' Buy and Sell with lots of tables displaying lots of wares.

In the spirit of a Buy and Sell, one man's junk became another man's treasure.

The future meetings will be held on



Richard VK5ZNC, new to contesting, and Sue VK5AYL, re-discovering HF.



Treasure or trash at the Buy and Sell ?

the third Thursday of each month at the Blackwood Recreation Hall starting at 7.30. Please contact Leigh VK5KLT, David VK5KT or John VK5EMI (when he returns from his holiday).

AHARS was saddened to hear that Bryan VK5SV has become an SK. Bryan had been a stalwart of the club for many years, holding the position of

Treasurer for 17 of them.

A number of members attended his funeral service along with many people from other parts of Bryan's life. He was a highly respected man in many fields, not least as 'the Eagle on the Hill' as he watched the activities of the Seacliff Sailing Club from his house.

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## VK2

Tim Mills VK2ZTM  
c/- arnews@tpg.com.au

Next month will be the 34th annual Field Day of the **Oxley Region ARC** - being held in Port Macquarie on the Sunday [7th] of the June long weekend. This year the Club will be holding a one day event advised Jim VK2VIV, Secretary of ORARC. The event will be held at the usual location, the Sea Scout Hall in Buller Street. It will run from 8 am to 4 pm with fox hunts, a BBQ lunch, Trash and Treasure, Trade and general displays. You can contact Jim on 02 6581 2481 or email him at vk2bor@orarc.org. There are more details on the web site [www.orarc.org](http://www.orarc.org)

The ABC TV Collectors program showed the Kurrajong Radio Museum segment on April 17th, a week later than first advised due to a programming change. The **St. George ARS** was the latest group to visit the Museum, which they did on the 26th April. You can check out the Museum by a Google search on "**Kurrajong Radio Museum**". Telephone 02 4573 0601 or email vk2zio@yahoo.com.au. Open at weekends - 10 am to 5 pm - or by arrangement.

The **Waverley ARS** have moved their HF SSB net to Sunday morning, starting at 7.30 am. Known as the 90NET, it

operates on or near 7.090 MHz. It and the Monday evening net on the Paddington repeater offer good opportunities to make contacts for their 90th anniversary award.

They are also planning to hold a dinner for the anniversary and they invite past club members to indicate attendance by email to [dinner@e-v-electronics.com](mailto:dinner@e-v-electronics.com) or telephone 02 9337 2909.

**Hornsby and District ARC** operated VK2IMD in the International Marconi Day on April 25th. They are planning exams this month, check out [www.hadarc.org.au](http://www.hadarc.org.au) or telephone Tony VK2BTL on 02 9487 3383.

The **Illawarra ARS** have their 2 metre D-STAR repeater VK2RDS fully operational on 146.7625 MHz with the normal -600 kHz offset, reports President Tony VK2TS. 70 cm and 23 cm frequencies will be confirmed soon. They have an extensive book and video library. The Club maintains 12 repeaters, three APRS digipeaters and several packet gateways. Their web site is [www.iars.org.au](http://www.iars.org.au). They meet on the second Tuesday evening.

By the time these notes appear the **NSW Division** will have had their AGM

and the new Council will be settling down to a busy and productive year. Also the 'shed' should have received its long awaited approval. At the end of this month - Sunday 31st May - is the next scheduled T&T at the VK2WI site. The morning T&T activity is followed in the afternoon by the **Homebrew and Experimenters Group** - with Show and Tell and lectures. At their March gathering the Group had the advantage of the shelter provided by the shed's veranda. This is along the east -front-side of the shed - three metres wide by 24 metres in length. Many of the Group helped in rolling the water tank onto its base at the end of the shed. They say many hands make light work.

By now the latest beacon in the VK2RSY stable should be on line. This one is on 432.420 MHz, CW mode with about 20 watts to the existing two bay crossed dipoles, currently at roof height. The commissioning of this unit restores the VHF and UHF beacon line up at the VK2WI Dural site in grid square QF56mh. See last month's VK2 notes for contact and reporting details.

73 - Tim VK2ZTM.

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## VK3

Peter Cossins VK3BFG

Website: [www.amateurradio.com.au](http://www.amateurradio.com.au)

Email: [arv@amateurradio.com.au](mailto:arv@amateurradio.com.au)

## AGM Tuesday 19 May

As previously advised, the Annual General Meeting of Amateur Radio Victoria (The Wireless Institute of Australia, Victorian Division) will be held this month.

In line with past practice, the Annual Report was issued on the Members Section of the website, hard copies made available on request or mailed to those members who had not registered and provided their current email address.

The meeting will consider the annual reports, the profit and loss account to 31 December 2008 and the balance sheet at that date. In other business, the Council for

2009-2012 will be announced as all seven current Councillors are being returned.

Come along to the AGM, a great social occasion with the business part of the meeting being fairly brief and followed by a member forum. It will be on Tuesday 19 May at 8 pm in the St Michaels Community Centre Hall, corner Victory Boulevard & High Street Ashburton (enter from Victory Blvd. Ample parking).

The Secretary/Treasurer's Report by Ross Pittard VK3CE comments on the impact of the global financial crisis and quick action taken by the Council to keep the organisation's investments secure, while maintaining the returns on them,

which contributes to more than 60% of the income each year.

With a range of initiatives in place there appears to be no reason in the foreseeable future to adjust the membership subscriptions.

Amateur Radio Victoria spent \$15,000 on its repeaters network in 2008. It is anticipated during 2009 that the D-STAR 2 metre repeater will be commissioned on Mt Macedon, the digital upgrade of VK3RTV has started, as well as upgrades and maintenance to the Victoria wide network.

Next year will be an important year for Amateur Radio celebrating our centenary and Council is working on

# News from VK3 continued

a number of initiatives to celebrate this important milestone, one of which will be the return of the Centre Victoria RadioFest at Kyneton.

The President's Report by Jim Linton VK3PC also comments briefly on the state of the economy and other factors such as higher imported equipment prices plus increased costs for those entering amateur radio.

Acknowledgement is given to the work of our Education Team headed up by Barry Robinson VK3PV, instructor Kevin Luxford VK3DAF and the pool of assessors that make a sterling contribution.

Our Event Coordinator Terry Murphy VK3UP with the assistance of others has consolidated the organisation's participation in both the ILLW and

JOTA. The revival of the Keith Roget Memorial National Parks Award occurred during the year and thank you to Chris Chapman VK3QB for taking on the role of managing it.

Throughout the year there are many radio amateurs who help in the running of Amateur Radio Victoria, all are thanked, particularly the office volunteers led by John Brown, plus the numerous repeater officers who quietly work in the background to maintain our network.

Finally, but not least, is acknowledgement of our Internet Project Development Officer, Gary Furr VK3FX who works quietly behind the scenes achieving consistent improvements in the organisation's online presence and e-membership services.

## Membership inquiries

To join and support the state-wide organisation Amateur Radio Victoria costs \$30 for Full or Associate membership (\$25 Concession), for two years. New members are most welcome and an application form can be found on our website or posted out on request.

## Foundation classes

Training and assessment sessions for the Foundation Licence will be held on the weekend of 23-24 May at Box Hill North. If you know someone who could be interested in becoming a radio amateur, or need more information then contact Barry Robinson VK3PV on 0428 516 001 or [foundation@amateurradio.com.au](mailto:foundation@amateurradio.com.au)

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# Geelong Radio and Electronics Society (GRES)

Rod Green VK3AYQ

Our formal meetings for the year started at the end of January. From then until the end of March much has been accomplished.

Unfortunately the month of February saw the terrible fires that ravaged parts of Victoria. Some of our members volunteered to work as radio operators at Kinglake. Neil VK3XNH was deployed for two five day periods at an Incident Control Centre. Upon his return Neil gave the members a detailed account of his experience.

Also during February we had a visit to the "Royal Australian Corps of Signals Museum" located at Simpson Barracks in McLeod, Melbourne. This visit had a twofold purpose. We were anxious to see the recently refurbished and reopened museum, but just as important as this, we had a number of military radios to donate to the museum. Major Jim Gordon VK3ZKK the manager of the museum thanked us for the donations.

Our syllabus for the first quarter has had some interesting topics; among these was Bill VK3YHT bringing along his extensive range of test equipment. This included both homebrew and commercial test gear. Bill, who is a retired communications technician, gave a description of each item which included

antenna analyzers, a Bird through-line watt meter, and a commercial spectrum analyzer.

Another talk that was of interest to all who own programmable radios was given by John VK3LJS. He described the uses of and the pitfalls in using software programs to program multimode/multiband transceivers.

We had one guest speaker during the quarter. This was Bob Tait VK3XP, a regular speaker. In the past Bob has spoken on auto electronics and associated topics, however this time he had a surprise for us.

He had organized a "bridge night" for us. Contrary to what you might think, this did not involve playing cards, but he outlined the many pieces of test equipment that were based on the Wheatstone bridge principle. These included SWR bridges, LC bridges, wattmeters and many other items that used a bridge. We are indebted to Bob not only for interesting and informative talks, but also as, after entertaining us for the evening, he then faces a two and a half hour drive home.

Our Wednesday group of retirees are still hard at work on the many jobs around our club rooms that never seem to diminish in number. Our on-going

collection and selling of scrap metal requires considerable effort, but over the years has been a great source of revenue for the club.

One job that has taken many man hours to complete was the setting up of a valve bank. Mainly due to the sterling effort put in by Keith VK3XKS we now have a bank of over 7000 valves consisting of over 600 different types. These valves, many of which have been salvaged from old radios, have all been tested and sorted into their respective categories. This bank will not only be of use to us when restoring old radios, but to any non members who are looking for replacement valves either for old broadcast radios or older boat anchor amateur equipment. Anyone looking for old valves may contact the club at PO Box 501 Belmont 3216. Alternatively we can be contacted via email at [vaycgres@netlink.com.au](mailto:vaycgres@netlink.com.au)

Visitors to Geelong are invited to attend our weekly meetings which are held at 8 pm local time at 237A High St Belmont, or call in for coffee and a chat on Wednesday mornings. Visitors are also reminded to call in and see our museum which is located in the Old Geelong Gaol situated in Myers St. Geelong.

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## News from VK3 continued

Joe Chakravarti VK3FJBC  
vk3er@emdrf.com.au  
http://www.emdrf.com.au

### Eastern and Mountain District Radio Club

It has been a while since I updated folks on what the Eastern and Mountain District Radio Club has been up to. Family commitments and other matters have that on the bottom of the list.

That does not mean that the members of the EMDRC have been sitting around and doing nothing. It is quite the reverse. The club has been so busy that even the dust has not had a chance to settle on the radios in the clubrooms.

And on the subject of clubrooms, the EMDRC has now moved to its newly refurbished complex downstairs. I take the liberty of calling it a complex because it is more than just a room and a shack. It is a radio amateur's dream come true. It is more like the pit garage equivalent of a Formula 1 team.....okay,

I am exaggerating a bit but you get the drift. We have a huge shack and library, a meeting room, showers, toilets, a kitchen, a construction room for club projects and storeroom. About the same time, the Whitehorse Centre returned the club to its original meeting venue, the newly refurbished Willis Room.

In February, we had the D-STAR meeting and barbeque which was a well attended event. Peter VK3TQ and Richard VK3JFK gave us a full update of where D-STAR now stood compared to when it first started.

This was followed by a trip to the Scoresby Steam Fest, where we set up our display. The event was a huge success and we really stood out among the weird and wonderful steam machines from the years gone by. Club members representing the EMDRC were at hand for all three days of the event to talk to roving visitors and many curious onlookers in between playing with the club's HF and 2/70 rigs. The club gained a new member from the exercise. Now the organizers of the event want a repeat presence next year!

This was interspersed by a group of members activating VK3ER at Mt Cowley for the John Moyle Memorial Field Day and a presentation on VKCL Logging software by Mike VK3AVV (<http://web.aanet.com.au/~mnds/index.htm>) and a presentation by Andrew VK3KIS on contesting in the US. Andrew and YL Barbara VK3AGU used to live in the US and still have links to the Bergen Amateur Radio Club. Meanwhile the ALARA ladies were busy with their own events with a lunch and a camping trip.

Just as members began to think that all the excitement was over, the EMDRC changed channels and went into WES mode. The annual White Elephant Sale was held at the usual location in late March and the 400 odd well-fed people that walked in through the door lapped up bargains at the same speed that they consumed the snags and hot dogs, not forgetting the thousands of cups of tea that flowed out of the kitchen.

At the time of writing, members are looking forward to a presentation on Telstra's site acquisitions by Steven from Telstra Wireless Operations, a presentation on ATV by Peter VK3BFG, a boat anchor night in May, followed by the AGM in June. It is all happening at the EMDRC!

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We have our eye on this Foden as a vehicle for our next DXpedition



David VK3DLR showing the flag at the Scoresby Steam Fest

**"Hey, Old  
Timer..."**

**If you  
have been  
licensed for  
more than 25  
years you are invited  
to join the  
Radio Amateurs  
Old Timers  
Club Australia**



or if you have been licensed for **less than 25 but more than ten years**, you are invited to become an **Associate Member** of the RAOTC.

In either case a **\$5.00** joining fee plus **\$8.00** for one year or **\$15.00** for two years gets you two interesting OTN Journals a year plus good fellowship.

Write to  
RAOTC,  
PO Box 107  
Mentone VIC 3194  
or call Derek VK3XY on 03 9563 6909 or  
Bill VK3BR on 03 9584 9512,  
or email to [raotc@raotc.org.au](mailto:raotc@raotc.org.au)  
for an application form.

# ALARA

Christine Taylor VK5CTY

## The AGM

Hope you were there and hope propagation was good that night. The makeup of the new committee will appear in next month's magazine.

## Luncheons

A lunch was held in VK4 at the Woodman's Hotel in Mudgeeraba with seven ALARA members present. The next luncheon in VK4 will be held in the clubrooms of the Gold Coast ARC in a couple of month's time.

Pam VK5PTO is settled in her new home with antennas up and she can be heard very well on Monday night nets.

The VK3 April lunch was at the Wheeler's Hill Hotel. A good crowd attended and there was much good chatter.

The girls were pleased to welcome Mavis VK3KS, one of the earliest members of ALARA. Gwen (another early member) was also present.

The VK3 state representative Jean VK3VIP brought her mother, visiting from ZL. Their next luncheon is in a few month's time. Watch for the emails.

## Almost an ALARA Field Day

The John Moyle Field Day held at Swan Reach by AHARS this year was very nearly an ALARA activity.

There were four active ALARA members there, all of whom made contacts. For some it was a regular event but for Sue VK5AYL it was very special.

Sue has had her licence for many years and was very active, particularly on VHF and Amateur TV, both in VK5 and VK2. Later she was active on HF from a country VK5 but for the last 15 or so years she has not operated at all.

She had a great time, made a lot of contacts and renewed her interest in HF and operating in general.

Her OM Richard VK5ZNC had and used his licence when he was at university but has not picked up a microphone since then. He also is now a keen amateur operator! Field Days are a great way to introduce or re-introduce amateurs to the joys of making contacts.

For Lesley VK5HLS, the Field Day was a bonus, too. She is chasing her DXCC with only 5 or 10 countries to go. When one of the operators on 40 called her to say he had a station in P29 who would be happy to give her a legal contact, she was delighted. She could not get over to that location quick enough, with her own log book in hand. Those last few countries can be very elusive.

## A well known YL operator will be less well known for a while

Shirley, previously VK5JSH, is now VK5YL.

There have only been two previous holders of that callsign. Betty Geisel was assigned VK5YL as an 18-year old in about 1937. She built her own transmitter and receiver and erected her own aerails, and was employed later as an electronic technician. When the War came, like all the amateurs, Betty had to

close down her station and as marriage and family came along after that she did not renew her licence.

When Denise came to live in VK5 in about 1959, after gaining her licence in VK1 (where she was given VK1YL), and a couple of years in the US, she was allotted VK5YL although she did not actually ask for it. Denise became an SK only a few years ago after using her callsign both on CW and on phone throughout that time. Denise was an active member of ALARA from shortly after its inception.

All Shirley's ALARA friends and all the people she had contacted on air and through Echolink wish her much joy with her new callsign.

If you have changed from a three letter call to a two letter one, please let us know so we can tell all your friends.

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Mavis VK3KS and Gwen VK3DYL, another early ALARA YL



ALARA members of AHARS at the Field Day. Tina VK5TMC, Sue VK5AYL, Christine VK5CTY and Lesley VK5HLS.



Jean VK3VIP with her mother visiting from ZL

## VK6

Keith Bainbridge VK6XH

This month I have been inundated with material!!! Maybe the message is getting through and people are realising I am only human and not a journalist! I am delighted that some clubs have been very active and took the time to report their activities in words and photos.

### Peel Amateur Radio Group (PARG)

*My son and I (VK6FJFB) had the pleasure of visiting Lyle Pattison VK6ALU and Dot in their lovely home in the RAAFA Estate Meadow Springs village.*

*Lyle describes himself as a simple minded user (SMU) with a big smile, but there is nothing simple about his knowledge. Lyle started amateur radio in NSW with the call sign VK2ALU. Three and a half years ago Lyle and Dot moved to Western Australia.*

*Lyle has had a hand in the pioneering of amateur radio. On 28 August 1996 Lyle and friends had a successful moon bounce on 10 GHz, creating a new Australian and World record, 17,004 km, on 10.368 GHz. Lyle's dream of this achievement started in 1959.*

*Lyle was a part of the Illawarra Amateur Radio Club, when he was approached by the Radio Astronomy System of CSIRO to do a moon bounce attempt together. In 1973/4 Lyle made his first EME contact on the 23 cm band.*

*Lyle did a working demonstration for the PARG at a monthly meeting. The power output on transmit is nominally 1 watt from the transmitter. The radiated power from the antenna is 1 kW. The signal is conveyed by the wave guide, which is connected to the antenna. The antenna is a feedhorn which is part of the parabolic reflector type antenna. The feedhorn is at the focal point. There are two modes, CW or SSB. Although made for battery operation, AC power can be used.*

*Lyle made this equipment from the ground up from various modules available and his own designs. The 2 m transceiver used for the IF is the only part not built by Lyle.*

*Thanks Lyle for an excellent presentation.* 73 Michelle.

Thank you Michelle for the report

### Hills Amateur Radio Group (HARG) swap meet

The HARG swap meet held on March 14th was an outstanding success. Over 120 enthusiasts passed through the door, forcing the BBQ crew to do a mad dash to the stores for more sausages.

A great variety of items was presented for sale on the 15 tables, ranging from small lengths of co-ax to amateur transceivers and high powered RF amplifiers. A local dealer, Hamshack, also had a display table offering a range of antennas, transceivers and test equipment. Many buyers left at the end of the day with great bargains

under their arms. The event was also an opportunity for friends to catch up. The chatter continued after most of the goodies had been sold. In particular it was pleasing to see a few of the club's long standing members attending and swapping stories.

First prize in the raffle was a Yaesu ATAS 120A Active Tuning Antenna System kindly donated by Vertex Standard. This was surprisingly passed over by the winner in favour of the Garmin Etrex GPS! The 2nd prize winner, Doug VK6FWDH, was elated in winning the ATAS 120A to go with

*Continued page 38*



PARG member Lyle Pattison VK6ALU demonstrating his 10 GHz portable transceiver.



High activity at the HARG swap meet.



## May Day Weekend

Time flies when you are having fun or it is when you are busy. Well that's Easter out of the way and then the dawn service for ANZAC Day (Lest We Forget), now May Day weekend is here.

I will be doing the annual trip to Clairview along with quite a few other amateur radio operators from far and wide for the annual greeting. I will use the monster auction to clear some of the "no longer required" from my shack and hope not to return with as much this year, we shall see. Mark your calendar, pack up the car and family to enjoy a great weekend.

Clairview is about 123 km south of Mackay city. Wet a line at Clairview Beach while sitting back and enjoying the view... you might even see a dugong. Clairview is a popular fishing and crabbing village with camping permitted in designated areas and a caravan park with full facilities. During the winter months, local groups sell arts and crafts and offer morning teas and soups.

Clairview Beach Holiday Park - Bookings on 07-49560190.

## Mackay Amateur Radio Association

The Mackay Amateur Radio Association is now having their monthly meetings on the second Tuesday of the month, at 7.30 pm at the SES Building, at the Mackay Regional Council Depot, at Ness Street, West Mackay.

## RADAR

The Rockhampton and Districts Amateur Radio club proudly displayed the hobby of amateur radio at the Heritage Village local Arts and Craft Market Day: with Foundation manuals being sold and, as a new recruit attended the following meeting, the day went very well.

## CW Training

John Saunders VK4BZ and George VK4XY have been promoting CW since last year. George VK4XY started a net on

10 m and then due to conflicting dates it went into hibernation. John picked it up later on in the year and moved it to 80 m for wider appeal and better signals (but a lot more QRM/QRN!).

The net runs on Thursday nights from 1030 Z onwards, on 3.665 MHz. John VK4BZ has it that far up in the band to avoid QRM and blocking the CW portion of the band with more SSB signals on the call-back. Practice Morse is sent at 9, 11 and 13 wpm, followed by a call-back and then a round-robin style CW net.

With this great offering John VK4BZ is helping people develop their CW skills.

John VK4BZ was getting to the point of discontinuing but with added interest from VK3 and VK1, it looks like he will continue. Redcliffe club has so many varied and diverse interests, but CW has been making a come-back, particularly since the members have seen some of the contest results we have been getting. In the 160 m CW contest, we blew people away when we worked KL7! It did not count for points in the contest but won a lot of kudos for the CW guys.

So if this is for you or even if you are not sure, then give it a try and find out.

Thanks John VK4BZ and George VK4XY.

## WICEN NET

You probably know David VK4IQ and Malcolm VK4ZMM are the Brisbane base operators for the regular Sunday morning WICEN HF Net. Malcolm VK4ZMM has been away, from the 9th of March for approximately two months, so it will be up to David to control the net whilst Malcolm is away. Feel free to join the Sunday morning net, at 0830 EST

## BARCFest 2009

Mount Gravatt Showgrounds is where you should be on the 9th May, with commercial dealers, displays, used gear, food/drinks and so much. Doors open at 9:30 in the morning. For more information see the website <http://www.qsl.net/vk4ba> or contact Les, the BarcFest coordinator 0411729642 email [parkerlf@optusnet.com.au](mailto:parkerlf@optusnet.com.au)

## Gladstone Amateur Radio Club

The Gladstone Amateur Radio Club promotes and supports the hobby of amateur radio in Gladstone and districts in Central Queensland, Australia. The repeaters are located at Mt Maurice in Gladstone on 146.625 MHz and IRLP node 6246 on 438.050 MHz, and also at Kroombit Tops on 146.900 MHz and 53.725 MHz with APRS.

Club meetings are held at 7:30 pm on the first Monday of every month (except January) at the SES Headquarters, Lamington Drive, Gladstone.

If you are passing through the region I have been advised by Rob VK4TW that there is an experimental 70 cm repeater operating halfway up the Narrows. It is operating but still licence pending, with a frequency of 438.675 negative offset.

## TARC Diary

Townsville Amateur Radio Club has a busy month for May:

Management Meeting: Tue May 5, 7:30 pm at SES HQ Green Street West End

Project Night: Tue May 12 from 7:30 pm at SES HQ Green Street West End

TCAC King of the Hill Climb: Sun May 17 Heat Two Communications Support Mt Stuart

Social Evening: Tue May 19 from 7:30 pm at SES HQ Green Street West End

TERAHA Horse Endurance Ride Communications Support: Sat and Sun May 23, 24 at Bluewater

Ann Renton Memorial Ladies net 26th May 26 from 7:30 pm on Townsville VHF Repeater

## People in Profile

Sorry, due to a busy month I was unable to catch up with my next victim. Oops, did I say that out loud. Stay tuned next month for another People in Profile. And for no pictures as my disk drive has failed me for my photo collection.

Until next time 73

VK4VKR (IRLP 6973)

On the side and listening.

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## VK7

Justin Giles-Clark VK7TW

Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

### Meet the Voice & Sewing Circle BBQ

The MTV/SC BBQ was held this year on 22 March at the picturesque Midland's town of Ross. The rain cleared, the weather became balmy and the hospitality was fantastic. Highlights included a presentation of the Sewing Machine Award to the most loquacious amateur of 2008, Vince VK7VH, and the presentation of two special awards to recognise the contribution to the Tasmanian amateur community in the area of repeaters to Joe Gelston VK7JG and Brian Morgan VK7RR.

The group heard a recording from Joy Batchler, 93, (formerly VK7YL) – VK7's first woman amateur back in 1935. Joy recorded her humorous recollections about how the Sewing Circle net got its name.

The Bargain Boot Bonanza was a roaring success with many bargains bought and sold and I believe an XYL was even traded...HIHI. Thanks to all involved especially Don VK7AY and Ray VK7VKV and all attendees, it was a great day and I look forward to the next one.

### North West News

#### North West Tasmanian Amateur TeleVision Group

The big news in the North West is the formation of a new amateur radio club – NWATVG.

The committee is: President - Tony Bedelph VK7AX, Vice President - Jim Hiley VK7JH, Secretary - Steve Bush VK7EQ, Treasurer - Ivan Ling VK7XL and Committee Member - Neil Southwell VK7ZNX. The main objectives are to promote the hobby of amateur radio and provide training and

assessments particularly for the youth of the North West community. The club has nominated an assessor and three learning facilitators. More information is at: <http://www2.vk7ax.id.au/atvgroup/>

#### North West Tasmanian Amateur Radio Interest Group

Recent elections for NWTARIG were declared void. New elections were held on 28 March with the following office holders elected: President - David Spicer VK7EX, Vice-President - Dick Whitley VK7FORF, Secretary - David Cleland VK7DC, Treasurer - Vernon French VK7VF and Committee Person: Eric Edwards VK7FEJE.

#### Northern Tasmanian Amateur Radio Club

Further to the squid pole antennas report last month - NTARC has exhausted the market in VK7 for the 9 metre poles, Phil VK7JJ was seen expounding the virtues of the design and many were seen at the Meet the Voice BBQ at Ross.

Apparently there are still orders flowing through for when the manufacturer restarts production! So have a chat with Ann VK7FYBG or Jason VK7ZJA.

At the time of writing there was a field day at Hollybank taking place where the squid pole antennas were being constructed and field tested. Lots of great amateur radio activity in the North of VK7.

#### REAST — Radio and Electronics Association of Southern Tasmania

Congratulations go to Gary VK7VMS, Tony VK7VAC (formerly VK7FACC), Ron VK7VUU (formerly VK7FEAA), Gary VK7THAO and Corey VK7FCJC

who all have their new call signs.

The REAST AGM was held on 15 March with the following office holders elected for 2009:

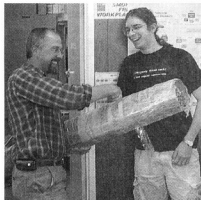
President - Gavin O'Shea VK7HGO, Vice-President - Dave Marsland VK7DM, Secretary - John Slevin VK7HJS, Treasurer - Richard Rogers VK7RO, Committee Member - Bob Warren VK7ZL and Warren Nicholas VK7FEET.

At the AGM there was a special presentation in memory of Matt Whayman (VK7MAT SK) who was tragically killed 10 years ago. Matt's mum, Carol donated a new – still in original package – 10-15 m beam that Matt never got the chance to put up.

It was presented to Thomas Karpiniec VK7NML as a gift in memory of Matt Whayman.

REAST's April presentation was given by our new President Gavin VK7HGO on what is involved with the running of the communications used in Targa Tasmania

*Continued next page*



At right: A beaming Thomas VK7NML (right) receiving the beam!



Meet the Voice & Sewing Circle BBQ at Ross

## Silent Key

### David Rankin VK3QV/9V1RH SK

David Rankin VK3QV/9V1RH passed away at home in Singapore on the morning of 19th March 2009. He was aged 74.

David was well known in the amateur radio community all around the world. On and off the air he will be remembered for his engaging conversations, his genuine, warm and friendly manner, and his deep interest in, and enthusiasm for amateur radio.

He was involved with the Victorian Division of the Wireless Institute of Australia (WIA), the Federal Executive, and was Federal Vice President for a number of years. David was an active member of the Singapore Amateur Radio Society (SARTS).

He was a great supporter of SEANET and his long term interest became International Amateur Radio Union (IARU) Region 3. David was Secretary of IARU Region 3 from 1973 to 1982, Chairman from 1982 to 1994 and Director from 1994 to 1997.

David's interest in amateur radio was kindled at an early age by Rod Biddle, an amateur who lived next door, and who ultimately went on to become Chief Engineer for Channel 9. David was first licensed as VK3ZQA in 1954. In 1959, he passed the Morse test and took the call VK3QV.

David joined the Federal Executive of the WIA as their VHF expert in 1959. He also held the position of Federal Activities Officer. David was actively involved in the VK3 VHF Group and the construction of the 144 MHz transmitter when VK3W1 was established in the Victorian Division rooms on Victoria Parade, East Melbourne.

David attended the 1968 Federal

**VK7** from previous page

— Australia's premier tarmac rally held 28 April and 3 May 2009.

The REAST ATV Experimenter's nights (Wednesdays 7:30 pm) are going gang-busters with more and more people coming along. We are now going out on both 70 cm Analogue (444.25 MHz) and 23 cm Digital (DVB-S on 1283 MHz) each night. <http://reast.asn.au/events.php#ATVnights>

Convention at which the formation of the IARU Region 3 organization was initiated. David was WIA Federal Vice President from 1969 to 1973, and remained on the Federal Executive until he moved to Singapore.

David was a Chartered Engineer, a member of the Institution of Engineers Australia (IE Aust) and a Fellow of the Institution of Radio and Electronic Engineers (IREE). He served in the National Service with 14th Battalion RAEME (Royal Australian Electrical & Mechanical Engineers) in 1954.

David commenced his professional career as an Electronics Engineer in 1957 with Austronic Engineering Laboratories and worked in nucleonic instrumentation and allied fields.

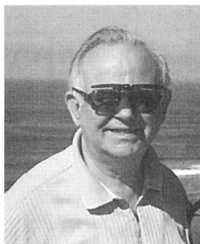
In 1958, David joined International Computers and Tabulators Pty Ltd, later to become ICL Ltd, and worked in customer service on punch card equipment and small computers. In 1961, David joined Pye Pty Ltd and worked there for eight years, mostly as Chief Engineer – Crystal Division.

David co-founded Hy-Q Electronics, a leading Australian crystal manufacturer, in Frankston, Victoria, in June 1969. He was the Technical Director of Hy-Q and went to Singapore when, as Hy-Q International, the company established a facility there in 1972. In 1976, David joined Rank O'Connor's as Technical Manager and was promoted to, and retired as, General Manager. David subsequently became the Managing Director for Fluke in Singapore, finally retiring from the profession in 1996.

David enjoyed immensely amateur radio and the many friends that he made through amateur radio. He gave an enormous amount of his time and himself to amateur radio over many years, particularly through his gentle and persistent encouragement to me, and through his service to the amateur radio community, the WIA, SARTS and the

### RAOTC Broadcasts in the NW

Thanks to Winston VK7EM, the Radio Amateurs Old Timers Club (RAOTC) monthly news broadcast can be heard on VK7RMD, (Mount Duncan) 2 metre repeater on the first Monday of each month (except January) at 8.30 pm local time.



David Rankin

IARU Region 3.

He leaves Adeline and children, Sheila and Edward.

David, we all shall miss you.  
Gerard Rankin VK5ZQV

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### VK6 from page 35

his new Yaesu transceiver.

The group also had the shack open and participated in the John Moyle Field Day. This gave prospective amateurs a close up view of a working HF station. Hopefully Ham College in Perth will see a few extra enrolments in their next Foundation course.

HARG would like to thank all attendees and will hold a swap meet next year, with more tables and an improved layout.

Thanks to Mick VK6YXL and all at HARG for a most enjoyable afternoon.

### NCRG CQ WPX contest

The NCRG put in its best effort ever in the CQ WPX contest in the Multi Single class and came very close to breaking the Australian record. Possibly another 10-20 contacts would have seen this happen. Maybe next year!

Preliminary results seem to show 5,063,982 points from 1733 contacts. 40 metres was the money band using the new three element beam. Improvements in the 80 metre antennas next year will push the club into the record books, I am sure. Well done to all 10 operators.

That is it for this month. Maybe we will have a positive change to the sunspot cycle by the time I write the next edition of VK6 Notes.

Vy 73 from Perth.

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# SERG and the Mount Gambier Legends of the Lakes Hill Climb

Charles Prime VK5XCP

South East Radio Group (SERG) has been helping with communications for the Legends of the Lakes Hill Climb event for three years. The event involves hill climb time trial racing up out of the Valley Lake crater in Mount Gambier.

Voice communication, provided by club members on 146.550 MHz from ten observation points, was critical to allow fast dispatch of vehicles, and to ensure safety.

At the event on November 8-9 SERG went beyond the voice communications provided in the past and also supplied video footage via ATV. Officials borrowed a CH37 UHF TV transmitter and with the cooperation of SERG and ACMA, a seven day transmitting licence was obtained.

The race was broadcast locally with SERG providing the TV links to the main transmitter. The main link was on 1250 MHz with a camera link on 70 cm.

There were ten manned observation points along the course plus an operator in the Race Control Centre, with two operators needed to do the video switching and two 'cameramen'.

Setup was on the Friday with SERG's trailer brought to site and all ATV transmitter antennas assembled and the links tested.

The weather was terrible and with rain and recorded wind gusts over 90 km/hr, made setting up a challenge.

Colin VK5DK, Charles VK5XCP and Andrew VK5KET were able to make themselves available to set up as much of the equipment as possible.

J-Pole antennas were used at some communications points so that mobile radios could be used with sufficient power to clear any obstacles.

The communications points had various roles. Bus entry points at top and bottom required our operators to pass messages and observations to race control about status of buses and barriers. Some points passed messages to flag marshals as required.

One observation point, communications point 4 (CP4), was to report when a car was clear so that the next car could start on the track.

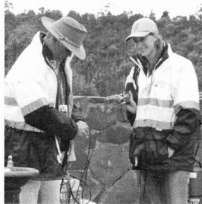
The start line operator would announce the car 'on the line' and give the signal to release it. After a few cars a rhythm was developed. The call from CP4 was important and it turned out there

was a 30-40 second window to put non-essential messages to race control without interfering with the start line. Sometimes it took two or three cars to get the messages through.

*Text continued on page 45*



Mike, one of the many SERG helpers, manning the cameras at the chicane.



Charles VK5XCP and Linley VK5FRED sorting it all out after an incident at the action packed chicane.



Andrew VK5FCLS and Steve VK5GL at the SERG trailer.

# 90th Anniversary of Radio Communications between the UK and Australia

Edwin Lowe VK2VEL

At 1100 hrs (AEST) on Monday 22nd September 2008, Sydney radio amateurs and members of the local community gathered at the Fisk Memorial outside the former house of Sir Ernest Fisk, at Wahroonga in Sydney, to commemorate the 90th anniversary of the first directed wireless messages from the UK to Australia.

On 22 September 1918, wireless messages from Prime Minister Billy Hughes and Minister of the Navy Joseph Cook, then in London, were transmitted from the 200 kW Marconi station MUU in Carnarvon, Wales on 14300 m (21 kHz) and received at the experimental receiving station at Fisk's Sydney home, 'Lucania'. Ernest Fisk was the managing director of Amalgamated Wireless (Australasia) Ltd, and the station was constructed by AWA technicians for the occasion.

In 1935, the Fisk Memorial was raised by the local community to commemorate the event. The 2008 celebrations were conducted by the Wahroonga Amateur Historical Radio Association, the Hornsby and Districts Amateur Radio Club and the Ku-ring-gai Historical Radio Society.

Jo Harris VK2KAA gave a short talk and played a recording of a speech by Guglielmo Marconi, and Peter Jensen VK2AQJ displayed his reproductions of period Marconi wireless equipment. An original print commemorating the event, incorporating facsimiles of the original AWA message forms, was displayed with the kind permission of the owners of 'Lucania'.

The event was well attended by radio amateurs and members of the local community, with a number of passing pedestrians stopping to ask questions and taking a copy of the informative pamphlet. Tim Mills VK2ZTM explained the story of the

figure of Mercury (aka Jimmy).

As a result of previous theft and vandalism, 'Jimmy' is removed and only attached once a year for the commemoration. The last time this figure of Jimmy was stolen, it turned up in a rubbish tip in Atherton, VK4, some 2500 km away.

Further reading:

*The First Direct Wireless Messages from England to Australia*, Colin MacKinnon VK2DYM (SK)

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Peter Jensen VK2AQJ and his reproduction wireless equipment display.



A view of Sir Ernest Fisk's former home 'Lucania', in Wahroonga, in suburban Sydney.



The figure of Mercury, also known as 'Jimmy'.



Peter Jensen VK2AQJ explaining his reproduction wireless equipment to interested visitors to the Fisk Memorial site.

## Contest Calendar for May 2009 – July 2009

May	9/10	CQ-M International DX Contest	CW/SSB
	9	VK/Trans-Tasman 80 metres Phone Contest	SSB
	16/17	King of Spain Contest	CW
June	30/31	CQ WW WPX Contest	CW
	6/7	IARU Region 1 Field Day	CW
	6/7	VK Shires Contest Rules this issue	SSB
	13	Asia/Pacific Sprint	SSB
	13	VK/trans-Tasman 160 metres Phone Contest	SSB
	13	Green Days Contest (see text)	CW/SSB/Digital
	20/21	All Asia DX	CW
	20/21	Winter VHF/UHF Field Day	All modes
	27/28	Marconi Memorial Contest	CW
	27/28	ARRL Field Day	All
July	1	Canada Day Contest	CW/SSB
	11/12	IARU HF Championship	CW
	12 (TBC)	Jack Files Memorial Contest	CW/SSB
	18/19	CQWW VHF Contest	All modes
	19	VK/trans-Tasman 160 metres CW Contest	CW
	25/26	RSGB IOTA Contest	CW/SSB

Welcome to this month's Contest Column.

### The sad demise of the ANARTS RTTY Contest

Pat Leeper recently informed me that she would be unable to continue managing the ANARTS RTTY contest due to failing health. Pat has made every effort to find someone else to take over the contest but with no success.

BARTG have had close links with ANARTS over the years and BARTG felt that they could help in some way. After discussions between Pat and the BARTG committee a decision has been reached on a course of action which I hope will meet with the approval of the RTTY contesting community.

For this year only the contest will be managed by John GW4SKA, the BARTG contest manager, with help towards expenses from ANARTS. The rules are much the same as in previous years but logs must be sent direct to [anarts@bartg.org.uk](mailto:anarts@bartg.org.uk).

The rules can be found at <http://www.anarts.com.au/rules2009.htm> and they will also be available on the BARTG website shortly. This will save any disappointment for those of the RTTY

persuasion who have made plans to enter the contest this year.

It is sad, but it appears that 2009 will be the last running of the ANARTS RTTY contest. From 2010 BARTG will be moving the BARTG HF RTTY contest from March to the 2nd weekend in June. This will give RTTY-ers a bit more time between Sprint and HF contests but also avoid the March clash of dates with the very popular Russian DX contest.

My thanks go to Pat for her cooperation and hard work in running the previous contests.

### WPX SSB Contest 2009 – will the REAL sunspots please stand up?

The WPX SSB contest was interesting this year. No sign of the awaited and much promised sun spots, so most of the traffic for the contest went LF – well almost! Top band seemed a little quiet from VK4 and 10 m was much the same also from this neck of the woods.

But VK contesters are made of stronger stuff and the absence of a few blemishes on a heavenly body did little to curb enthusiasm. Talking of blemishes on a heavenly body, my hearty congratulations go to Andrew

Munson VK4HAM on producing his own imminent population explosion in Toowoomba. Andrew's wife Sharon is expecting their second offspring later this year. This comes as little surprise to those who know Andrew well and have operated a contest alongside him, as he obviously had to be good at something!

A group of like-minded chaps got together at my place to assemble whatever radio hardware that could be mustered into resembling a contest station. The antenna system was a bit of a compromise in places, but we managed to cobble together a monobander for 10 m and another for 15, a tribander for 20 m and an assortment of aluminium poking into the air for LF. Gravity played a cruel trump card however, in that Andrew's crank-up mast decided that holding an antenna aloft was not how it wanted to spend the weekend, and down it came – vertically thankfully – and telescoped back into itself with a loud thud. The winch cable had broken. The 20 m antenna elements wagged around in the air like an over exuberant dog's tail, but the central mountings for the elements onto the boom did not see the funny side and instantly broke in two. I had some spare parts, but the resultant hurriedly

repaired antenna was a shadow if its former self and performed accordingly when shown some RF. So, with the 20 m antenna now relocated to the highest support that we could muster, the 15 m monobander reluctantly shuffled across to being second in the pecking order – and sat sulking for the next 48 hours at 5 m off the floor.

HF proved to be a tad wobbly as regards propagation over the weekend, with 80 m wagging around between the US, then JA, then EU and back again. 40 m was quite good and our bits of aluminium pole seemed to do the job. 20 m was pitiful, but 15 m went like a bomb! The terrain of the land lent itself to the performance and we managed to snare a healthy number of QSOs into the log.

We worked quite a number of VKs during the contest: Laurie VK7ZE was hammering away on 20 m as a single band entry and the pride of WA VK6ANC were setting the ether alight in the Multi-single category with their impressive new set-up.

Was there a downside to the weekend of socialising and radio? Well, only the usual 'Contest Police' who roam the bands during such events looking for something to whinge about. Cries of "Your signal is wide" or "You are using too much power" are usually the cry of those with a front end as wide as the bridge across Sydney Harbour as a lament to those putting time and effort into assembling large LF arrays. I was no stranger to this aspect that weekend as a chap seemingly wanted to discuss all-manner of topics about how strong my signal was – but he had not considered that he was S9+40dB to me so clearly we were both receiving each other with consummate ease. However, my receiver could easily handle the strong signal and did not overload – seemingly his could not. Nor did he want to learn something evidently new to him about the front end of receivers....

A change of receiving antenna dropped the howls of protest from him into the ether and I continued having fun in the contest. No doubt, just like others of a kindred spirit, he QSY'd to find something (or someone) else to complain about. A lot of time, effort and money has gone into the design and implementation of the LF systems at my station and I am not about to bow-down to the seemingly

tall poppy syndrome that raises its ugly head at times during contest weekends.

Anyway, we (VK4TI, VK4NDX, VK4HAM, VK4SN and our humble scribe) had a fun weekend regardless.

## WPX Scores for 2008 – Addendum

I have been chastised by Tony VK3TZ! Tony writes: "Please could you include my score from YJ8TZ as an addendum, as I was number 9 in the world in the TS category high power. I actually got a certificate that I was 6th but they stuffed it up somehow. Also came 3rd in Oceania overall, missing out on #2 by a very small margin to a KH6".

Tony's score was 2,776,869 from 1921 QSOs and 513 prefixes. Nice going, Tony - sorry about the omission!

## Ethical? Probably not.

Some interesting contesting tactics were observed during the contest. A certain gentlemen residing in Oceania, teamed-up with a chum in EU and his European pal proceeded to call CQ within EU stating that his mate was also on the frequency. This is an effective way to break through the EU wall of noise but is, of course, not in the spirit of the contest nor is it legal in my opinion as regards the rules. I understand that the contest organisers have been made aware of this arrangement and by all accounts action will be taken.

## BERU Comments and Claimed Scores

BERU claimed scores are shown below. The team changed at the last minute as John Loftus VK4EMM could not gain access to his usual station facilities. With much reluctance, John handed the baton to the first reserve and sat BERU 2009 out. Karl VK2KM has stepped into the breach and did a fine job in John's place.

Kevin VK6LW	6,390 points
Barry VK2BJ	5,510 points
David VK2NU	4,555 points
Karl VK2KM	4,530 points
Alan VK6BN	4,500 points
Mike VK6HD	4,405 points
Martin VK7GN	4,315 points
Steve VK6VZ	4,150 points
Russ VK4XA	2,830 points
Les VK4BUI	3,900 points

Thanks again to Steve VK6VZ for

organising the team event – let us hope that the Team got another win in the bag!

There is some talk about the HQ stations, in that situations exist such as VE being one DXCC entity, yet is allowed potentially 7 or more HQ stations, whereas the UK consists of 7 DX entities, with only 1 HQ station. If the UK provinces were to become separate BERU entities, it is quite likely that the default winning location would move to the UK. One critical advantage of the current arrangement is the open playing field, in that BERU can be won from many different areas of the world, depending upon propagation on the day. Personally, I am not convinced that we need any HQ stations at all in BERU, let alone a whole heap more! I have yet to be convinced that having more HQ stations active will result in increased interest and activity in the contest. No doubt, time will tell.

## Green Days Contest

Strange as it may seem (to me at least) for an electricity consuming contest to be denoted as 'green', news arrives that the World Flora Fauna organization have organized GreenDays and are asking for participation of radio amateurs all around the world to contact other radio enthusiasts working from territories of national natural parks and reserves of the world which are set off under program WFF.

The contest is intended to celebrate the first anniversary of the commencement of the World Flora Fauna program, and to raise awareness of the various issues pertaining to protected natural territories and the preservation of vanishing species of flora and fauna. The organisers recommend that stations call "CQ GreenDays" on SSB and "CQ GD" on CW. The ham radio inhabitants of the Isle of Man will no doubt be surprised to learn of the myriad of "CQ GD" calls being made on the bands! Further details can be found at <http://www.wff44.com/en/contest/>

If you have any contest related material for inclusion within the column, topics that you would like covered or even some experiences and pictures you would like to share, then please feel free to get in touch via [vk4baa@wia.org.au](mailto:vk4baa@wia.org.au).

## John Moyle Field Day VK2AWA

The guys and gals of the VK2AWA Contest Group took to the bush to compete in the prestigious John Moyle Memorial Field Day Contest. The Contest Group Members who took part in the operation were:

Vlad VK2IM, Russell VK2VK, Tomas VK2CCC, Leonie VK2FHRK, Lisa VK2LKH, Phil VK2FIRE, Allan VK2OJ, Warren VK2UWP, Graham

VK2FCLR, Tony VK2VAC, Richard VK2KRM and Paul VK2BPL.

Peter VK2YPW provided the use of his caravan for the weekend.

The antennas used were an inverted V dipole at about 18 metres for 160; inverted V dipole at about 18 m for 80; 2-element Moxon beam at about 18 m for 40; 3-element monoband Yagi at about 12 m for 20 and dipoles for 15 and 10 metres at about 7.6 m.

This year the conditions were very

down but they managed to bag over 1400+ QSOs.

The contest was also the occasion for VK4HAM to show-off his newly acquired haircut – see photo. As reported last month, Andy was taking part in the World's Greatest Shave, but it looks like they got a bit carried away with the fringe. Maybe he should get Sharon to knit a balaclava whilst she's knitting the booties for the next junior operator....

See you on the bands.

73 de VK4BAA Phil Smeaton

ar



Up she goes! VK2AWA getting ready for the Moyle. Photo: VK2BPL.



Andrew Munson VK4HAM seems pleased with his haircut. Photo: VK4HAM.

# New contest—Australian Shires

Hot from the keyboards of Bill Horner VK4FW and Trent Sampson VK4TI is news of a new contest for VK.

In the last few weeks there has been much excitement over the new contest and quite a number of testers have been involved in the creation of the rules. Already, operators who intend to go to a rarer shire for the actual contest have been in touch with Bill and Trent to ensure that their station and location comply with the requirements of the contest rules. The contest offers the field day practice of the John Moyle, the DX potential of the Oceania Contest and the friendliness of the RD contest.

Some of the new style contest is the introduction of multipliers on every band and the ability for a rover station to rework everyone for extra points from

a new shire. The organisers have also introduced a new VK Shires award to support the contest.

The objectives of this contest are for amateurs around the world to contact as many VK shires as possible in the contest period. VK amateurs are to work the world including VK, whilst the rest of the world can only work VK. For VK stations, the multiplier is each VK shire worked per band and mode as above as well as each CQ Zone worked per band and mode.

Interestingly, the contest organisers have heeded the cries of those who have less love for contesting and complain of increased band occupancy during contest weekends. Participants need to watch their operating frequency, else risk QSOs being invalid for points. The frequency

limits are also meant to enable all licence holders to have a level playing field as far as possible.

Rules for the contest are over the page at the time of going to print, but check the website for the latest.



# Rules for the Australian Shires Contest

The contest will be held on the weekend prior to the second Monday of June every year.

**Starts:** 06.00 UTC

Saturday, June 6, 2009

**Ends:** 06.00 UTC

Sunday, June 7, 2009

**Contest Period:** 24 hours for all stations, all categories.

**Objectives:** The objectives of this contest are for amateurs around the world to contact as many VK shires as possible in the contest period, i.e. VK amateurs are to work the world including VK, whilst the rest of the world can only work VK

**A) Bands:** 80 metres 3.500 - 3.700 MHz, 40 metres 7.000 - 7.250 MHz, 20 metres 14.000 - 14.300 MHz, 15 metres 21.000 - 21.350 MHz, 10 metres 28.000 - 28.600 MHz. Please note there is no 75 m DX window permitted for VK stations which means the rest of the world can operate above 3.700 MHz i.e. split operation.

**B) Modes:** SSB and CW only

## Class of Competition:

For all categories:

Transmitters and receivers for a fixed station must be located within a 500 metre diameter circle or within the property limits of the station licensee's address, whichever is greater.

If you are a member of a multi op team you can not partake in the contest as an individual in any way. Please note that you are permitted to have up to two transmitted signals going simultaneously.

All contest operation must be within operator's licence restrictions and conditions, eg power output, bands used, etc.

Single Op stations are only permitted one transmitted signal at a time.

No operator is permitted to use more than one callsign for the entirety of the contest.

A Rover station is a VK station which goes either portable or mobile for the entirety of the contest. Please note that all portable equipment can not be set up prior to the Friday preceding the contest and no earlier than at 0001 UTC. The Rover who moves into a new SHIRE may count the same MULTIPLIER more than once per band as long as the Rover

is in a new SHIRE location. Such change in location must be clearly indicated in the log. i.e. A Rover station becomes a new QSO to the stations working them when that STATION changes SHIRE locator.

Please note that in all categories below you may change band and mode as often as you like. You may also work the same station multiple consecutive bands/modes one behind the other: e.g. work VK4FW on 20 m SSB then QSY to 15 m CW then QSY to 80 m CW then QSY to 40 m SSB etc.

1. VK Single - Op All Band Rover: Single operator(s) must do all contest related activities by themselves.
2. VK Multi - Two All Band Rover: Is 2 or more operators with maximum of two transmitted signals at any one time. This category MUST USE Software CONTEST LOGGERS. All operators must be fully listed when the log is submitted.
3. VK Single Op All Band: same conditions as number 1 above.
4. VK Multi - Two All Band: same conditions as number 2 above.
5. VK Single Op Foundation: Is a VK Foundation licensee who must do all contest related activities by themselves.
6. DX Single Op - All Band: Is a single op who must do all contest related activities by themselves.

## Exchange:

All VK operators to exchange callsign, RST followed by the VK shire abbreviation as per the official list provided: e.g. VK4FW 59BU4 or 599BU4

Stations outside VK to exchange callsign, RST followed by CQ ZONE: e.g. ZL1AMO 5932 or 59932

## Multipliers:

For stations outside VK: The multiplier is the number of different VK shires worked per band. A "VK shire" is counted once per band per mode: i.e. If you work it on SSB it can be counted again on CW. To enter the contest you must have worked at least one VK Shire.

**For VK Stations:** The multiplier is

each VK shire worked per band and mode as above as well as each CQ Zone worked per band and mode.

NB. Variation for rover stations. Rovers can rework from multiple locations.

## Scoring:

One (1) point per QSO

Multiply total QSO points times total number of multipliers worked (i.e. If you worked 33 on 80 m, 43 on 40 m, 16 on 20 m, 21 on 15 m and 5 on 10 m that would be a total of 118)

**Example 1:** VK4FW works stations as follows:

600 QSOs x 1 point = 600 points

118 VK shires worked + 35 CQ zones worked = 153

600 x 153 = 91,800

VK4FW final score is 91,800

**Example 2:** ZL1AMO works stations as follows:

700 QSOs with VK amateurs x 1 point = 700

118 VK shires work

700 x 118 = 82,600

ZL1AMO final score is 82,600

## Awards:

**VK Stations:** Certificates suitable for framing will be awarded to the top scoring stations in each category as well as place getters depending on entries received. A minimum of 100 QSOs must be made to be eligible to receive a certificate.

**Stations outside VK:** Certificates suitable for framing will be awarded to the top scoring stations in each category as well as place getters depending on entries received for each continent. A minimum of 100 QSOs must be made to be eligible to receive a certificate.

*\*\* Please note we hope to be able to award a minimum of 4 certificates per category.*

The various categories listed below have been sponsored by the operators indicated for the next three years (until 2011).

Category	Donor
1. VK Single Op	Phil Smeaton VK4BAA
2. VK Multi Two	Laurie Porter VK4VCC

3. VK Single Op Foundation	Nick Hacko VK2DX
4. VK Single Op Rover	John Ferrington VK6HZ
5. VK Multi Two Rover	Trent Sampson VK4TI
6. DX Single Op	as below
a) North America	Craig Edwards VK5HRT
b) South America	Dave Clifford VK4NDX
c) Asia	Diane and Bill Main VK4KYL and VK4ZD
d) Europe	Andrew Munson VK4HAM
e) Africa	Paul Hanna VK2HV
f) Oceania	Robert Duck VK2VRD

### Miscellaneous:

An operator may sign only one callsign during the contest. This means that an operator cannot generate QSOs by first signing his callsign, then signing his daughter's callsign, even though both callsigns are assigned to the same location.

If in fact a fixed VK station is located on the border of more than one VK shire, they must choose only one VK shire from which to operate.

Utilising the various internet DX

clusters etc is permitted however ANY FORM OF SOLICITED OR SELF SPOTTING INCLUDING CLUB MEMBERS SPOTTING CLUB OPERATIONS WILL RESULT IN NIL RESULT OF THE LOG.

Any use by an entrant of any non-amateur means including, but not limited to, telephones, email, Internet, Instant Messenger, chat rooms, VOIP, or the use of packet to solicit, arrange, or confirm any contacts during the contest is unsportsmanlike and the entry is subject to disqualification.

Aeronautical mobile or maritime mobile contacts do not count [for points].

UTC is the required logging time.

### Log Submissions:

Log entries must be submitted by September 1, 2009 to be eligible for awards. Submit your electronic log in the Cabrillo format created by all major logging programs. Send via e-mail attachment to contest@vkshires.info

**Subject line:** Callsign (used in the contest) only. SINGLE OP stations may submit a paper log, only if they make less than 100 QSOs.

VK entrants are reminded to be

sure their log indicates their VK shire location. If you go portable or mobile the log must clearly define where you changed location.

Click on the "VK SHIRES Web Form" link on the contest website at: [www.vkshires.info](http://www.vkshires.info)

Computer-generated logs must be e-submitted. Callsigns of electronic logs received are posted and updated regularly on the website.

Any queries or enquiries please email [vkshires@vkshires.info](mailto:vkshires@vkshires.info)

A great deal of work has been spent putting the rules together but the organisers acknowledge that questions will arise and that queries will be welcomed and promptly answered. One area of probable concern might be that Weipa is not currently allocated to a VK shire and operators from that part of VK will not be able to give the correct contest exchange from their home QTH. However, there are a number of VK shires that do not have an amateur located in them and the Rover category might prove to be highly beneficial to them during the contest.

**www.vkshires.info**

73 de VK4BAA Phil Smeaton

### SERG at MT Gambler from page 39

Racing incidents requiring a stoppage were announced immediately and racing was paused. Safety issues were reported immediately on 146.550 MHz as this was away from the calling frequency and repeaters.

Various radios were used: many handhelds, some mobiles in cars and, in high traffic or difficult locations, some higher power mobiles on 10 W from a battery.

Some of the positions were comfortable, operating from cars or other shelter. Communications points 4 and 5 however were rather exposed on the side of the track halfway up the hill.

A little rain and some wind added chill factor started to show on the operators. To make it easier nobody spent more than half a day at CP4 or CP5. The view from these points is rather spectacular.

To assist with promoting the event, and for the enjoyment of all, the Channel 37 TV transmitter was in the Centenary Tower, a very high point. To get the signals from the OB van to the transmitter, an ATV transmitter link was used. Colin

VK5DK and Andrew VK5KET have been experimenting with ATV since before the 2007 event and 1250 MHz was used for the link to the broadcast transmitter. During the preceding week a test was done at the venue.

There was some concern over attenuation through the trees but a six metre mast took care of that.

The transmitter is a 1250 MHz ATV kit with a PLL Kit and audio sub-carrier board, all from Mark VK5EME at Mini-Kits. Colin did an excellent job of building them up.

With the Yagis built by Colin, 8 mW gave excellent pictures into the UHF transmitter. The link ran faultlessly. During testing a vertical line was on the transmission, however a quick email sent to Mark at Mini-Kits elicited a solution. We are very impressed with the kits from Mini-Kits and the service and support is excellent. Thanks Mark. The 70 cm ATV link is also a Mini-Kit design.

SERG had 20 members and six friends helping. VK5's ZGY, NC, XCP, FRED, DK, AKJ, NKJ, JFK, KET, FCLS, EE, GL, FWJT, FJIM, DG, KEE, FOXX,

LAC, ZOO attended at some point over the weekend and we had Ollie and Owen in the OB van, Mike and Darlene at Chicane camera and Terry and Sheryl (XYL FCLS) taking photos.

### The weekend numbers:

There were 110 competitors that raced in two blocks. All finishing competitors made 8 runs on the course; approximately 850 runs were made up the hill.

Excellent operator practices resulted in cars being released every 40 seconds.

Trevor VK5NC called 856 cars to the start line and Greg VK5ZGY recorded and tracked all 856 cars, course cars and recovery vehicles.

There were 50 track check calls, 35 information calls and 28 incident calls.

Estimated top speed for the winner was over 200 km/hr. Winning time was 54.36 sec.

Linley VK5FRED took just over 3000 photos and ran her batteries flat. Six four-hour video tapes were used to record the action.

Best of all, nobody was seriously injured.

# DX - News & Views

John Bazley VK4OQ

email: john.bazley@bigpond.com

## Reefs, Rocks and other remote spots

By the time you read this the **VK9M Mellish Reef** trip will have taken place and hopefully all returned home safely. To me it is incredible the trouble and risks taken by some of these operations. For example - quoting from a bulletin issued by them on March 20th when they were en route to Mellish Reef:

*Friday, March 20 0800 UTC, Marion Reef. Extreme WX conditions continue preventing us from leaving Marion Reef. Winds are 40 knots + (75+ km/h) and waves are 12 to 16 feet (3.5-5 m) high outside the reef. The low-pressure system behind this extreme weather is now forecast to develop into a Tropical Low by Mar 21 and a Tropical Cyclone by Mar 23. Movement is forecast to be to the north and north-east (away from us and from Mellish), but the forecast is tentative at this stage. We will keep a close eye on this system as it poses a serious danger to us. While waiting at Marion Reef we have been testing our equipment (and making a number of MM QSO-s). We have found that the K3 got damaged in transport. With great on-line support from Wayne N6KR of Elecraft, we were able to fix it.*

Still on the subject of hazardous operations, I note that Theo ON4ATW and others have a plan to activate **Rockall (EU-189)** for three days during the first week of May using the callsign MM0RAI/p. A dedicated website is under construction and is expected to be launched by the end of March.

Hazardous? Well you can form your own opinion! Rockall is a small, uninhabited, rocky islet in the north Atlantic Ocean, about 25.3 metres (83 ft) wide and 31 metres (100 ft) long at

its base and rises sheer to a height of approximately 21.4 metres (70 ft). It is regularly washed over by large storm waves, particularly in winter. There is a small ledge of 3.5 by 1.3 metres (11 by 4 ft), known as "Hall's Ledge", 4 metres (13 ft) from the summit. They will be doing well to stay there three days!

Forthcoming DXpeditions include 9M6XRO, returning once again to **Africa**. He plans to travel to Johannesburg via Kuala Lumpur and Doha on July 25th. He will help ZS6JR load and move gear to Lesotho, TP, and set up antennas and gear before the rest of the ops arrive on July 29th. He hopes to have ZS6/GM3OOK on the air while en route, possibly the evening of July 25th. He also feels he may be able to operate as 3DAOOK from Swaziland, the dates depending on how the rest of the operation goes. Everyone is due back in Johannesburg August 13. The flight back to Borneo is August 14th, via Doha. QSL via M0URX.

In spite of rumours that the **YW0A Aves Island** DXpedition operation has been cancelled everything is in order for the upcoming expedition. Navy permission has been received for an April-May operation. Exact dates are still being negotiated. The YW0A DXpedition Web site can be found at [www.yw0a.4m5dx.info](http://www.yw0a.4m5dx.info)

Wayne W5KDJ may postpone his July DXpedition to **Madagascar**. He may try again in November. Understandably, Wayne says the political situation is too unsettled to go at present.

We have not received any news or updates from either Flo FT5WO or Petrus ZS8T. You may recollect that Flo is on **Crozet** until the end of this year. On the other hand Petrus is on **Marion Island** until April or May. Not much time left now for some serious amateur radio activity but we must remember they are both on those remote islands on work assignments and not DXpeditions.

Bodo DL3OCH/HB9EHJ is now in **Abuja, Nigeria**. His equipment consists of a TS-450, IC-7000, IC-706, 50 A power supply, 5-band Spiderbeam, 10 metre mast, mono-band vertical for 30 m, 40 m and 80 m. At the moment Bodo

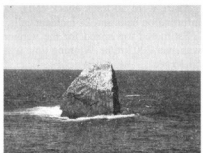
is not sure yet what kind of antenna will be used for 160 metres but he is planning to be active on Top Band. He has been assigned the call sign 5N0OCH, which he will use for all short wave activities.

Bodo plans to be on the air mostly in the evenings and on weekends on CW but he will also be on SSB and RTTY. EME antennas and amplifiers have also arrived safely in Nigeria. Bodo will team up with some other 5N ops for EME activities. He also has plans to activate IOTA AF-076, but no details at the moment. All QSLs (bureau or direct) go via DL3OCH. He will answer all cards after his return to Switzerland in August. Further information can be found at <http://www.dl3och.de/>

Just another reminder for the future! After a seven-year hiatus, in late January 2009, the US Fish & Wildlife Service announced that they would once again allow amateur radio operations from **Midway Atoll (OC-030)** "on a trial basis". A multi national team of 19 operators will be active as K4M from Midway for ten days between 5th and 19th October. They will have 5-6 stations active on 160-6 metres, with at least one station on 20 m around the clock. Further information, including details on how to contribute to this expensive expedition, can be found at [www.midway2009.com](http://www.midway2009.com)

VK6AA will be on from **Western Australia** in the WPX CW event May 30-31. Operator VK2IA will be single band 40 m. He will be at the radio club station 20 km north of the centre of Perth. QSL via DL8YR. You can find out more about the station at this site: <http://www.ncrg.org.au>

A team from ARI San Severo and a few guest operators will be active as IL7G from the **Tremi Islands (EU-050)** from 30th May to 2nd June. They plan to operate CW, SSB and RTTY on 160 m - 70 cm, and to participate in the 13th Gargano Contest (31 May, 6 m CW and SSB). QSL via IW7EBE, direct or via the bureau. The logs will be uploaded to LoTW. Further information can be found at [www.qrz.com](http://www.qrz.com) under IL7G.



Rockall Island

Continued foot of page 47



## Monitoring the extended 7 MHz amateur allocation — 7100 and 7200 kHz

When the new season commenced at 0200 on the 29<sup>th</sup> of March, we were excited to start monitoring the extended 7 MHz amateur allocation between 7100 and 7200 kHz.

It has been extremely interesting observing the changes day by day, as broadcasters vacated to other channels leaving it to the amateurs to enjoy. Coincidentally that weekend saw a major amateur DX contest and there was plenty of activity from Europe and North America yet few from Australia. The only ones observed were the few regulars who have skeds with North Americans.

It took several days for broadcasters to depart and as expected the Chinese were slow to do so. Apparently several clandestines also operate in this segment and the Chinese seem to utilise their HF signals as a de facto jamming signal.

I am excited at what I have so far heard, despite my limited indoor antenna. There is a clandestine on 7100 between 2000 and signing off at 2059 and initial reports indicated it was directed to Ethiopia. However the language and music sounded very similar to that Kurdish PKK station, which was on 7510. The anthem at the signoff sounded identical.

Then there were several Chinese signals, 7125 carried the Minorities Network known as CNR-8 and is easily heard in our local mornings and in the evening hours. It is parallel to 6200, which is reported to be Tibet. However

the Chinese have separated Tibetan from the Minorities Network and created CNR-11 in Tibetan.

There are also Chinese signals on 7120 and 7105 but these are well down and could be jamming known Taiwanese signals. 7105 also used to be the BBC from both Thailand and Singapore in Chinese but they too have migrated elsewhere. There seems little point for them to be there. However the Chinese deny they jam and say that their stations are legitimately there to service local audiences.

7185 sees several signals with two or more Chinese signals carrying identical programming with each sender being delayed to give an eerie echo effect. This is against a long-standing Taiwanese network that has been there for many decades. 7100 sees North Korea occasionally but Pyongyang is on 7140 in various languages and is in parallel to 3560.

Once the dust settled and hams discovered the vacant channels, they were excited at what was on offer. I heard an Italian at very good strength at around 2145 being called by a K1 from Boston. He was as equally surprised as I, because I too could hear him via the long path. It was 5:45 pm EDT in Mass, which meant it was about sunset there and half an hour after my local sunrise. There is a well-known VK7 DXer in the Tamar Valley that should have been there. Hi Norm!

The other news is that the Russians

have revamped their web presence with a new URL and expanded their language services online as MP3 files. Unfortunately they have cutback their presence on shortwave by eliminating 12 languages and some of these are now a short five minute podcast. They made a big announcement that the Voice of Russia World Service was reverting to a 24/7 format but do not be deceived. It is available on the web.

The VOR to Australasia is on from 0600-0900 21790 and 17635, and from 0900-1000, 21790. You could also try these services as well:

### ASIA

0300-0500 15735, 15755, 15585  
0700-0900 1251  
0900-1100 15610, 15470  
1100-1200 15470, 12065,  
1200-1300 15470, 12065, 7330, 603  
1300-1400 12065, 7330.

Deutsche Welle from Cologne is being heard from their Trincomealee Relay on 9735 in English from 2100 to 2155. It is a very good signal. I also noticed the BBC World Service on 6195 in English from 2100 to 2200 and judging by the signal strength it must be coming either from Brandon or Shepparton, here in Australia. RA has been running this service on 11690 and 9660 at the same time so I am assuming they are now on 6195.

Well that is all for this month. If you have any news, please email me at vk7rh@wia.org.au

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### DX Continued

#### Some QSL information.

A note from Roger G3SXW: *A station signing EP21A has been QRV this week on 40 metres CW, asking for QSL via qrz.com. This was my call in the 1970s but I know nothing about the current operation. If the call-sign has been re-issued I would expect him to give a valid QSL route. But qrz.com points at G3SXW so I must conclude that this is a pirate operation.*

QSLs via 3A2LF. Claude 3A2LF is closing the logs for 3A100GM (1995), 3A7G (1997) and 3A50R (1999). If

you still need a card, please go direct to Claude Passet, 3 allée Guillaume Apollinaire, MC 98000 Monaco. Claude still has blank cards for other special callsigns, please e-mail him (cpasset@monaco.mc) and check for availability.

There has apparently been questions about the QSL route for H40FN, operated by Siegfried Hari DK9FN who was on Pigeon Island (OC-065), along with Bernard H40MS (DL2GAC/H44MS) and Hermann H40HP (DL2NUD). Bernard H40MS says HA8FW is the correct QSL route for H40FN. This is

the route that has been mentioned in all of the previous press releases as well as what Siegfried has been giving on the air. The listing on QRZ.COM says DK9FN and this needs to be updated.

Good luck in the pile-ups.

Special thanks to the authors of *The Daily DX (W3UR)*, 425 DX News (11JQJ) and *QRZ.DX* for information appearing in this month's DX News & Views. For interested readers you can obtain from W3UR a free two-week trial of The Daily DX from [www.dailydx.com/trial.htm](http://www.dailydx.com/trial.htm)

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## How to use AO-51's 2.4 GHz downlink

So you have tried AO-51 in mode V/U with a couple of handhelds and small Yagis. Want to try another challenge where the antennas are smaller, the downlink is louder and the competition is less? AO-51's most powerful transmitter is on 2401.2 MHz and is not much harder to use than the 70 cm downlinks. During March I constructed a simple 13 turn helix, put it on a camera tripod and made a few QSOs. But first some background.

### Description of AO-51's 2.4 GHz setup

The 2.4 GHz transmitter on AO-51 operates as an extension of the 435.300 MHz transmitter. It can be used with or instead of the 435.300 MHz transmitter. Its modes of operation are FM voice or digital with baud rates of 38400 or higher. It cannot be modulated properly for 9600 baud digital operation.

The antenna is positioned in the

centre of the same face as the 70 cm canted turnstile. It is a sleeve monopole antenna that shares the same connector as the 1268.7 MHz receiver antenna. It is similar to a ¼ wave groundplane and has low gain and is linearly polarised.

The transmitter is electrically less efficient than the 70 cm transmitters and has a fixed output of 1.2 Watts. This limits its use to periods with short or no eclipses.

### How does it compare with 70 cm? A bit more theory.

So how does it compare with a 70 cm portable transceiver and small Yagi? This section is based on the link budget calculator from the AMSAT-NA website[1]. First we look at the 70 cm downlink with a power output of 0.5 Watts (+27 dBm). The antenna gain is 2 dBic (circular polarisation). At the horizon the path loss over the maximum range of 3000 km is -155 dB.

Take away another 3 dB for polarisation mismatch (circular to linear) and 1 dB for ionospheric disturbance and the signal level is only -130 dBm. At the ground station end we have an Arrow antenna with a gain of 7 dBi and a FT-817. The FT-817 sensitivity is specified for -122 dBm on FM to receive a minimum usable signal. Adding all the above gives:

Satellite Tx (minimum)	+27 dBm
Antenna Gain	+2 dB
Path Loss	-155 dB
Polarisation mismatch	-3 dB
Ionosphere	-1 dB
Hand held Yagi gain	+7 dB
Signal at FT-817	-123 dBm

So you might hear it at the horizon, just. When AO-51 is overhead (~800 km away) the path loss improves to -143 dB so the signal now is -111 dBm; a 12 dB increase or S3 on the S-meter.

For 2.4 GHz, the Tx power increases

## AMSAT-VK

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Group Moderator: Judy Williams VK2TJU

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Website: www.amsat-vk.org Group site:  
group.amsat-vk.org

### About AMSAT-VK

AMSAT-VK is a group of Australian amateur radio operators who share a common interest in building, launching and communicating with each other through non-commercial Amateur Radio satellites. Many of our members also have an interest in other space based communications, including listening to and communicating with the International Space Station, Earth-Moon-Earth (EME), monitoring weather (WX) satellites and other spacecraft.

AMSAT-VK is the primary point of contact for those interested in becoming involved in amateur radio satellite operations. If you are interested in learning more about satellite operations or just wish to become a member of AMSAT-Australia, please see our website.

### AMSAT-VK monthly nets

**Australian National Satellite net**  
The net takes place on the 2nd Tuesday

of each month at 8.30 pm eastern time, that is 9.30 Z or 10.30 Z depending on daylight saving. The AMSAT-VK net has been running for many years with the aim of allowing amateur radio operators who are operating or have an interest in working in the satellite mode, to make contact with others in order to share their experiences and to catch up on pertinent news. The format also facilitates other aspects like making 'skeds' and for a general 'off-bird' chat. In addition to the EchoLink conference, the net will also be available via RF on the following repeaters and links.

#### In New South Wales

VK2RMP Maddens Plains repeater on  
146.850 MHz

VK2RIS Saddleback repeater on 146.975  
MHz

VK2RBT Mt Boyne Repeater on 146.675  
MHz

#### In Victoria

VK3RTL Laverton, Melbourne, 438.600  
MHz FM, - 5 MHz offset

#### In the Northern Territory

VK8MA Katherine 146.700 MHz FM

#### In South Australia

VK5TRM Loxton on 147.125 MHz  
Operators may join the net via the above

repeaters or by connecting to EchoLink on either the AMSAT-NA or VK3JED conferences. The net is also available via IRLP reflector number 9509. We are keen to have the net carried by other EchoLink or IRLP enabled repeaters and links in order to improve coverage. If you are interested in carrying our net on your system, please contact Paul via email.

### AMSAT-VK HF net

Members and interested parties are also reminded of our HF net which is held on the 2nd Sunday of each month. See www.amsat-vk.org for details.

## Become involved

Amateur satellite operating is one of the most interesting and rewarding modes in our hobby. The birds are relatively easy to access and require very little hardware investment to get started. You can gain access to the FM 'repeaters in the sky' with just a dual band handheld operating on 2 m and 70 cm. These easy-to-use and popular FM satellites will give hams national communications and handheld access into New Zealand at various times through the day and night.

Should you wish to join AMSAT-VK, details are available on the web site or sign-up at our group site as above. Membership is free and you will be made very welcome.

to 1.2 Watts (+31 dBm) and the path loss becomes -170 dB at 3000 km. The antenna gain and polarisation mismatch remain the same. So far it looks 11 dB worse. The ground station antenna is now a 13 turn helix with a gain of +16 dBic [2],[3]. The MMDS downconverter has a noise figure of 3 dB which translates to a sensitivity of -132 dBm. Adding all the numbers gives:

Satellite Tx (minimum)	+31 dBm
Antenna Gain	+2 dB
Path Loss	-170 dB
Polarisation mismatch	-3 dB
Ionosphere	-1 dB
13 turn helix gain	+16 dB
Signal at downconverter	-125 dBm

So the signal level is now 7 dB above the downconverter's noise floor. At the horizon, you can hear that clearly. To get the same result on 70 cm you would need to add a low noise pre-amp or quadruple the size of the antenna. Overhead the path improves to -158 dB and the signal is now 19 dB above the noise. The 13 turn helix is only 40 cm long, half the length of the 6 element 70 cm Yagi.

But it is not all good news. The antenna on AO-51 is in the middle of the face that points away from the Earth over the South Pole. The body of AO-51 will shield the antenna from us causing deep but short fades as it turns.

2.4 GHz also has trouble getting through foliage. Some successful AO-40 users found that one essential tool they needed was a chainsaw.

Finally the Doppler shift is proportionally greater. From  $\pm 9$  kHz at 70 cm to  $\pm 45$  kHz at 2.4 GHz. With FM this is not much of a problem. Using 5 kHz steps it is easy to manually keep track of the Doppler shift.

## OK I'm convinced. So what do I need to hear it?

A receive setup needs an antenna, a downconverter and optionally a bias tee, an attenuator and a test oscillator.

The most critical piece in the puzzle is the downconverter. Most common are the Multipoint Multi-channel Distribution Service (MMDS) downconverters used for terrestrial data links. These are broadband converters with an input range between 2.1 to 2.7 GHz and an output between 100 and 500 MHz, depending on the model. Generally they fall into two types for the Australian and

US markets. The Australian versions use a 1951 MHz local oscillator that converts the 2401.2 MHz signal down to 450.2 MHz. These are suitable for most 70 cm receivers and usually need no modification. The US versions use a 2278 MHz local oscillator that converts down to 123.2 MHz. Again many receivers will tune to this area in the aircraft band. Matt VK2DAG has compiled a list of available types on his website [4].

Some of these converters have been modified by changing the reference crystal to give an output in an amateur band. One advantage of leaving the downconverter's output outside of an amateur band is that it is harder to damage them by accidentally transmitting into them. The best downconverters have an external antenna connector, usually an N type. The output connector is usually an F type used for satellite TV receivers.

If the local oscillator frequency is not known there are two ways of finding it. By listening to the local oscillator's crystal frequency or using a test signal. The first method needs a HF receiver. The local oscillator is a phase locked loop design with the output frequency divided by 128 or 256 and referenced to a crystal oscillator. So for an Australian MMDS downconverter there should be a strong signal near  $1951/128=15.242$  MHz or  $1951/256=7.621$  MHz. For an U.S. Model  $2278/128=17.797$  MHz and  $2278/256=8.898$  MHz. There is some variation between units and the local oscillator frequency can be up to 50 kHz away from what you would expect.

Any of the transverters used for 2.403 GHz terrestrial duty will work as well if not better than a MMDS downconverter. As long as the receive noise figure is below 7dB.

The second method is to use a test signal. Laboratory grade 2.4 GHz signal generators are rather esoteric pieces of equipment. But for our purposes, a test signal generator can be made very easily and cheaply. All that is needed is a 5 V computer crystal oscillator module and listen for the harmonic. The 100th harmonic of my 24 MHz oscillator is easily heard across a room. The 24 MHz signal is also heard on 144 MHz and 432 MHz. 32, 36, 40, 48 and 50 MHz oscillator modules can also be used. My oscillator block has wires soldered to it for the 5 volt supply and an antenna wire just 31 mm long and can be heard across

the room. A couple of versions can be found at the AMSAT-ZL website [5].

The next vital part is the antenna. It is better to use a circularly polarised antenna and suffer the 3 dB polarisation mismatch than use a linear type and suffer a 20 dB polarisation mismatch as you turn it the wrong way. Antenna gain is easy to obtain at 2.4 GHz and still have a physically manageable antenna. You do not need a dish. A small helix is simple to construct and works well. A circular patch (for a dish feed) also works but only has a gain of 8 dB and is not much better than the 70 cm example setup. Using a "BBQ grill" with a gain of over 20 dB also works. But it is heavier than a helix and needs greater pointing accuracy.

Downconverters are fed d.c. power via the coax. Some sort of bias-tee is needed. The power requirements are 200-300 mA at 12 V. They all have an on-board voltage regulator. Some of the US types use an internal 12 V regulator and need 16-18 V. These are easy to make. You need a small inductor between the d.c. supply and coax to the downconverter and a d.c. blocking capacitor between the receiver and the inductor. The air wound inductor can be 10 turns with a 3 mm diameter. The capacitor can be 100 pF. Values are not critical.

The final but optional piece is an attenuator in front of your receiver. Downconverters have high gain IF amplifiers and generate plenty of noise. You will know your downconverter is plugged in and powered up when you see a S8 noise floor. A 10-20 dB attenuator will improve your receive setup by giving some dynamic headroom.

## Operating quirks

Mode V/S (Uplink: 145.880 MHz, Downlink: 2401.2 MHz): By now you may have worked out the emphasis of this article is using the 2 m uplink and voice modes. You are right. I have not used the digital downlink as I do not have a TNC capable of 38400 baud. Also I do not have a reliable setup for the 1268.7 MHz uplink. Mode V/S voice is the most popular use of AO-51's 2.4 GHz downlink.

It appears that using a downconverter/transverter with a 2 m IF would cause desense problems. My DB6NT transverter gives an output of 145.2 MHz and the uplink is around 145.9 MHz. With the antennas far enough

apart and the 700 kHz between uplink and downlink, desense has not been a problem. The MMDS with 450 MHz and 123 MHz output show no desense. Mode V/S naturally shares the same uplink characteristics of mode V/U.

Mode L/S (Uplink: 1268.7 MHz, Downlink: 2401.2 MHz): During 2005 I borrowed a 1268 MHz transmitter. During one week AO-51 was in mode V/S voice then mode L/S voice so comparisons could be made. Those of us who tried it found that it was harder to get through the satellite with mode L/S than with mode V/S.

### The proof of the pudding

During March AO-51 was set to mode V/S and V/U simultaneously. I was able to try out my freshly made helix mounted on a camera tripod in the backyard. This was used with 3 different downconverters (Australian MMDS, US MMDS and DB6NT transverter) feeding a FT-817 receiver. For 70 cm I used a home-brewed 6 element 'cheap-Yagi'. The 2.4 GHz setup signals peaked 8-S points above their noise floors and were down to S2 at the horizon. The 70 cm setup struggled to get to S3. While the S-Meter on the FT-817 does not follow the 6 dB per S-point definition, it shows

that the 2.4 GHz downlink is much stronger than the 70 cm downlink, thus proving the theory.

### Summary

For little outlay and a bit of experimenting and construction you can experience the loudest transmitter AO-51 has to offer. The performance of the 2.4 GHz downlink is much better than the 435 MHz downlinks. This was confirmed during tests made in March.

### References

- [1] [http://www.amsat.org/amsat-new/echo/Echo\\_Linkbudget.php](http://www.amsat.org/amsat-new/echo/Echo_Linkbudget.php)
- [2] James Miller G3RUH, A 16 Turn S-Band Helix, <http://www.amsat.org/amsat/articles/g3ruh/117.html>
- [3] Clare Fowler VE3NPC, Real World Helix Antenna Comparison Measurements, The AMSAT Journal Volume 29, Number 3 May/June 2006
- [4] Matt VK2DAG, Australian MMDS types, <http://web.aanet.com.au/vk2dag/types.html>
- [5] A simple 2.4 GHz signal source, [http://homepages.ihug.co.nz/~jpsl/a\\_simple\\_3.htm](http://homepages.ihug.co.nz/~jpsl/a_simple_3.htm)

### Introduction to me

Recently Paul VK2TXT asked for volunteers to contribute articles for the

AMSAT column, and I decided to have a go. I was first licensed in 1986 and have been actively using OSCARs since 1997. Since AO-40 went silent my main focus has been with the analogue satellites and the Cubesats. I have listened to just about all of them on every used band from 29 MHz to 24 GHz and talked to the world through some of them. Sometimes the world spoke back.

The biggest highlight was hearing AO-40 for the second time. I first heard AO-40's 2 m beacon before that transmitter went silent. The second time was the 2.4 GHz S2 beacon using a BBQ grill tied to a iron dropper, an MMDS downconverter, coax without a connector (did not know what an F-type plug was at the time) out in the back yard at 5 am on a cold autumn morning.

I could just hear the beacon above the noise from a spacecraft 55000 km away using a bodgy setup that would not work for the local MMDS TV system only 35 km away. The station has improved considerably since then but I still carry out the odd experiment in the backyard.

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## First German Mars Mission makes sidestep to Venus Ground station in Bochum generated echoes from Venus.

The team of German Space Agency AMSAT-DL reached another milestone on the way to sending a spacecraft to Mars on 25 March 2009. From ground mission control station in Bochum (located in the observatory IUZ Sternwarte) radio frequency signals were sent to Venus. After nearly 100 million kilometres of track and approximately five minute's delay they came back again as echoes from Venus and were received in Bochum. This was the first German success to receive echoes from other planets.

The transmitter technology for the planned Mars mission of AMSAT-DL was the last key component tested and fulfils its baptism of fire.

The AMSAT-DL prepares the first privately financed flight to Mars for the next possible launch window. This spacecraft is intended as a scientific and communication platform. In the last few years the largely honorary researcher of the AMSAT-DL developed

and tested all essential components for this spacecraft. Many technical elements were successfully trialled on satellites in earth orbits.

With reception of its own echoes from Venus the ground commando station is ready for lift-off and the AMSAT-DL team is waiting in the wings to construct the spacecraft.

Development, design and construction of this first German Mars mission has been achieved through work by the AMSAT-DL and its partner organisations. Already a third of the total project costs have been committed. More work shall follow during the mission. To finance the specific construction costs and the launch costs AMSAT-DL tries to get financial support from the DLR (Deutsches

Zentrum für Luft- und Raumfahrt). There is a need for 20 million Euros.

The AMSAT would like to demonstrate that their approaches to low-cost space missions are feasible. For comparison, these days the ESA and NASA missions

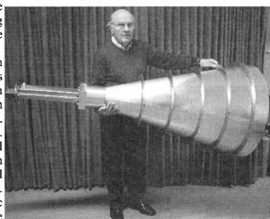


Photo 1: Project leader of AMSAT-Mars-Mission, Prof. Dr. Karl Meinzer with feeder antenna of the command station in Bochum.



Figure 2: 20-m-Parabolic Reflector Antenna of observatory "IUZ Sternwarte Bochum" used by AMSAT-DL for the command station.

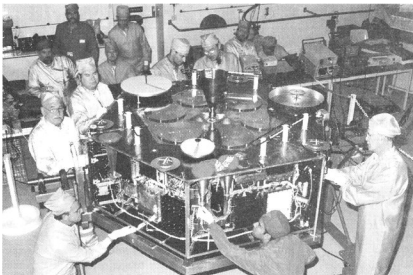


Figure 3: The technological foundations for the Mars mission was created by construction of earth satellite AO-40/P3D, launched in 2000 using an ARIANE 5 rocket.

to Mars have cost ten times as much.

The Mars mission is committed to the open source principle. Private donors can contribute to the mission. A website was set up for Mars tickets, <http://www.ticket-to-mars.org>. Anyone can buy a ticket to Mars from fifty Euros.

Through the open source principle it allows everyone to receive the mission data live during the flight to Mars. This is possible by using amateur radio

frequencies and one's own receiver with a dish of at least one metre diameter. If such equipment is not available then it is also possible to get a live stream via Internet. All necessary information will be disclosed before the mission.

### Background information

The AMSAT-DL is an association of engineers, technicians, scientists, amateur radio and space enthusiasts who

have over 30 years experience of satellite development, building and operation. All photos: AMSAT-DL

### Links:

AMSAT-DL: <http://www.amsat-dl.org>  
 Mars-Mission: <http://www.go-mars.org>  
 Ticket-to-Mars: <http://www.ticket-to-mars.org>  
 Venus transmission:  
[http://www.amsat-dl.org/index.php?option=com\\_content&task=view&id=165&Itemid=97](http://www.amsat-dl.org/index.php?option=com_content&task=view&id=165&Itemid=97)

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## Silent Key

### Alan Peake VK2ADB

Alan Peake VK2ADB passed away on Wednesday 25th of February at Cooma Hospital. Alan was well known on air, being an enthusiastic CW operator who contributed to the VK2BWI Morse sessions and the "Fifteen words per minute net" on 80 metres over a long period of time. Alan was highly regarded for his skills as a CW operator, his Morse was precise and clear with an easily recognized and distinctive "fist".

Alan was President of the Snowy Mountains Amateur Radio Club at the time of his passing and will be sadly missed by his fellow club members and his friends "on air". His contribution to the establishment and management of our club is of great importance to us and will serve as a solid foundation for our future.

Professionally, Alan had a long career in Public Service in the field of electronics. A large part of that time

being in the area of defence. He worked at various times with Australia's defence forces on weapons research. Alan retired in his late fifties and built his house on a small property near Adaminaby in the Snowy. Having retired, he was able to concentrate on his many interests, including amateur radio, rifle shooting and listening to classical music. Alan was a prolific home brewer and experimenter. His technical expertise was applied to projects ranging from antenna design to repair and maintenance of complex electronic devices, including modern transceivers and associated electronic equipment. His technical advice was often in demand by his friends in amateur radio and was always enthusiastically given.

Alan was an accomplished target shooter and represented his country as a member of national teams that traveled to Europe, North America, South Africa and Eastern Europe to compete. He was

highly regarded by his fellow shooters and was made a member of the sport's Hall Of Fame. As a competitor, he was a winner of competition at a high level within the last few months of his life, to the amazement of his team mates and other participants.

Alan David Peake was quite an achiever in all fields of his choice. He was a stickler for attention to detail and his determination to achieve high standards in his endeavors will be admired and respected by all who knew him.

Family and friends will be marking Alan's passing by coming together to commemorate his life and deposit his ashes in a shady tree-lined grove near a creek on his property in the Snow Country.

Farewell and 73 Alan.  
 Submitted by Bill Steptoe VK2ZZF and fellow club members of the Snowy Mountains Amateur Radio Club.

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# VHF/UHF – An Expanding World

David Smith VK3HZ  
vk3hz@wia.org.au

## Weak Signal

David Smith - VK3HZ

On the afternoon of March 25th, there was another tropo opening from the east coast across to NZ – probably the last for the season. At 0140 Z, Bob ZL3TY reported hearing the Newcastle Channel 5A TV audio at S7. Eventually at 0715 Z, with Channel 5A still coming through, he managed an SSB contact with Steve VK2ZT on 2 m with 5x5/5x6 reports. At 0733 Z, Colin VK2BCC also worked Bob on CW with 5x1/5x3 reports. Several others were heard, but no contacts made.

Then on the evening of March 27th, the bands opened up across the Bright from VK3 to VK6. At 1230 Z, Mike VK3KH and Ross VK3MY reported hearing the Albany 2 m and 70 cm beacons and the Esperance 70 cm beacon, all at around S2. An hour later, the Albany 70 cm beacon had risen to S9 at Ross' QTH. However, it was a case of "no-one's home" and unfortunately no contacts were made.

There has recently been a surge of interest in the 23 cm band, and there are now a number of stations with high power, good antenna systems and sensitive receivers. The current National record on 23 cm was set 21 years ago between Les VK3ZBJ (SK) in Frankston and Wally VK6WG in Albany – a distance of 2455 km. I think it's highly likely that this record will be broken in the next year or two but, of course, it requires everything to come together – conditions and people on-air at each end!

## 70 cm Band

The ACMA have been undertaking a review of what they refer to as the 400 MHz band (403 - 520 MHz). The review specifically excluded any consideration of changes to the 430 - 440 MHz area, but it did include a review of the remainder of our 70 cm band. A recent update from the ACMA has now also excluded any changes to the 440 - 450 MHz area, much to the relief of the ATV enthusiasts and other users of this area.

However, the ACMA has said that they

have identified the 403 - 430 MHz sub-band for exclusive government use, and will be transitioning other users out of that area over the next few years.

Up until the late 1990s, we had full access (on a Secondary basis) to the 420 - 430 MHz range. This was changed, initially due to security arrangements for the Sydney Olympics, and restrictions were placed on operation in certain frequency ranges within certain areas (NSW, ACT, Melbourne, Perth). This situation still stands.

What the latest ACMA proposal says is that the 420 - 430 MHz range will now be reserved exclusively for government use. So, goodbye amateurs. I think in the minds of many, we had already lost that segment. However, this proposal now sets the loss in concrete.

## EVE

On March 25th, a group of German amateurs from AMSAT-DL achieved the first amateur planetary "bounce", receiving their own echoes back from Venus. They used the 20 m Bochum Observatory dish, transmitting 5 kW on 2.4 GHz (close to 1 Gigawatt ERP). The receiver used very long integration time and narrow bandwidth to pick the very weak reflections out of the noise after the 100 million km, five minute round trip. More details can be found on the AMSAT-DL site:

<http://www.amsat-dl.org/pic/gallery2/d/7561-1/AMSAT-Venus-PM-E.pdf>

See also the story elsewhere in this issue of AR.

## John Moyle Field Day

After having magnificent weather and band conditions for the Summer VHF/UHF Field Day, the JMFD turned on the complete opposite conditions in the south of the country with the weather little short of appalling in some areas. I spent Saturday afternoon at the Bushfire Benefit Concert at the MCG, and I had first-hand experience of two deluges and extended periods of very ordinary conditions there!

However, the award for the worst experience (and a story that will no-doubt be retold for many years) would probably go to the VK2SMC group who set themselves up (or attempted to) at their usual site near Cabramurra in the Snowy Mountains.

*Over to David VK2IDM:*

"Apologies to all that were looking for contacts from VK2SMC but the weather unfortunately got the better of us this time.

The team (Rod VK2TWR, Glen VK2CCW, John VK2IJM and I) arrived at the site on Saturday and after setting up the sleeping tents and the equipment shelter we were unable to raise the tower and commence contacts due to a severe approaching electrical storm.

The brunt of the storm hit us just after 3:00 pm and it continued until about 5:30. The wind gusts were extreme and resulted in structural damage to the equipment shelter. The 20 mm of rain also infiltrated some of the sleeping tents and made the entire site very soggy.

After the weather cleared we set about drying off wet gear and making repairs to the equipment shelter and with sunset looming we also focused on getting the BBQ and dinner preparations under way, but still hoping to get on air as soon as we finished our much awaited dinner (steak, sausages, veggies and bottle of red wine).

However our hopes of getting on air were dashed again just after dinner when a second and even more severe storm front came through dumping well over 20 mm of rain (yet again) and with even more severe lightning strikes. This second front did not move out until after 10:00 pm but with more damage to the shelter and another drying out period we were unable to get on the air on any band.

We unanimously decided to put the kettle on, have a warm cuppa and then head off to bed. There was a moment of humour when a very close lightning strike hit just after Glen had retired into his tent, which resulted in Glen sprinting

100 m in his underwear to take safe refuge within his motor vehicle Faraday cage.

However, any thoughts of the weather eventually abating and allowing us a good night's sleep were dispelled when a powerful wind front hit shortly after 11:00 pm. The temperature also dropped from 11 degrees to just above zero and

there were moments of sleety rain in the gales that followed. Glen's tunnel tent was ripped from its anchors and he spent an uncomfortable night battling to keep his tent on the mountain.

The next morning felt like mid winter with the thermometers barely above zero and a gale force SW wind blowing. We decided to let the gear dry and to decamp

ASAP and to retreat to the warmth of much lower altitudes.

Yes, we took a battering and ultimately we were defeated but we will definitely be out there again next year to try it all again."

Please send any Weak Signal reports to David VK3HZ at [vk3hz@wia.org.au](mailto:vk3hz@wia.org.au).

## Digital DX Modes

Rex Moncur VK7MO

Congratulations to John VK4JMC and Bob ZL1RS on completing an FSK441 contact across the Tasman over a distance of 2193 km.

Welcome to Phil VK4FIL and John VK7XX who have been joining in the weekend 2 metre, meteor scatter activity sessions. John is also operational on 2 metres with JT65.

The use of GPS locked rigs and the waterfall audio analysis program, Spectrum Lab, provides the opportunity to examine the effects of propagation on signals at bandwidths of a few milliHertz and explore such issues as the frequency spreading on tropo-scatter. Figure 1 shows some initial results between Jim VK3II and Rex VK7MO on two metres over a 520 km path. The horizontal scale on the graphs spans around 0.2 Hz or 200 mHz and the width of the bins is 5 mHz. The left-hand graph was produced locally from separate GPS units. It shows some minor frequency drift of less than 5 mHz. A separate test between Jim and Dave VK3HZ showed similarly stable signals over a relatively short distance. The vertical scale is approximately 30 minutes.

The centre graph shows broadening of the VHF signal presumably due to the multi-pathing effects of tropo-scatter. The spreading is surprisingly

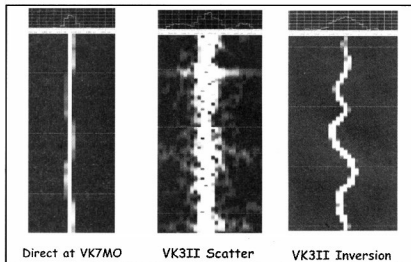


Figure 1: Shows Frequency effects on VHF signals

small and generally within around 50 mHz with the major excursions possibly due to micro-meteors. The right-hand graph was produced on a night where there was an inversion present and the slow, almost sine-wave, drift might be explained by the rising and falling of the inversion layer introducing Doppler shift. Later tests have shown a similar narrowing of the frequency spread during inversions but without the slow sine-wave variations. Also later tests

have shown variations in the amount of spreading on a scatter path by a factor of four to one on different nights. While this is early days it appears that through the use of GPS locked rigs and very narrow bandwidth waterfall programs there are interesting opportunities for hams to explore various forms of propagation.

Please send any Digital DX Modes reports to Rex VK7MO at [rmoncur@bigpond.net.au](mailto:rmoncur@bigpond.net.au).

## The Magic Band – 6 m DX

Brian Cleland VK5BC

Conditions continued to be poor during March with no Es openings reported and very limited TE openings to JA from northern Queensland.

Kevin VK4BKP reported hearing JA beacons on the 14th March.

The best opening for the month to Japan occurred on the 15th March with the opening extending south to VK5. Garry VK4ABW north of Townsville worked Kazu JA1RJU, Masa JA6TEW and Ken

JA5FFJ. Kevin VK4BKP in Mackay also worked JA1RJU and reported hearing the JE7YNQ and JA1ZYK beacons. Meanwhile Brian VK5BC reported the 49.750 MHz carriers up to S9 and the JA6YBR beacon S4 and eventually around 0800UTC worked JA6TEW and JE6AZU. This was the first JA opening to Southern Australia since April 2007.

On the 17th March Ray VK4BLK in Yeppoon worked JG3LEB.

The Tablelands Radio and Electronics Club report that they have received approval for a 6 m beacon VK4RHT on 50.281 MHz to be located west of Mareeba in QH23pc. They hope to have the beacon operational shortly - look forward to hearing it.

Please send any 6 m information to Brian VK5BC at [briancleland@bigpond.com](mailto:briancleland@bigpond.com)

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## WANTED NSW

FT-902 in excellent condition, also accessories to make complete line up including speaker, vfo, tuner, transverter and FL-2100Z if available. Cash buyer. Thanks. Mike VK2OT guzziv10@bigpond.com

YAESU FT-101E/EE/FF transceiver. Must be in very good to excellent cosmetic condition and preferably in working order. If you have one of these radios that you no longer need, please contact me. Gary Baxter VK2GAB, 02 9439 8845, garybaxter@aapt.net.au

REPAIRS needed to a Yaesu FT-101E, receives OK, mic controls OK, everything seems to work OK but with no carrier wave. St George — Sutherland area Sydney. Contact Gary (02) 9583 1531 or newlome@bigpond.com

## FOR SALE VIC

HUSTLER Super RM80S 80 m trap and ground plane to suit HUSTLER 4BTU trapped vertical antenna. If you have no room for an 80 m dipole, this trap with an ATU is an excellent option. More details, ask for Stan on 03 9743 6706. VK3BNJ \$110 ono.

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Vintage SINGER GERTSCH FM-10C communications service monitor. Circa 1970 test set. Still a useful piece of test equipment. Powers up but not tested. Includes: FM10C Test set chassis, RFM-10A RF Module, FIM-1 frequency indication monitor, MDM-1 meter deviation monitor, product data bulletin "data sheet", FM-10C operator's manual, FM-10C maintenance manual, Two way radio servicing application note, 12 V option power cable. Operates from 240 V AC but appears to be able to run on 115 V AC as well. Also has 12 V option. Serial Number: 1199-050855. \$750. Peter VK3DXD vk3dxd@gmail.com 0400 447 742

## WANTED VIC

HEATHKIT valve voltmeter mode V-7A, meter only or whole unit. VK3KO QTHR 03 9877 5938.

## WANTED QLD

YAESU transceiver model FT-1012D or FT-1012 with handbook, no lightning, water or smoke problems. Also AMECO model PT-3 preselector, handbook and circuit. Brad Booth VK4CDL, 48 Gregory St, Cardwell 4849, bradtimmy@hotmail.com

Antenna tuner able to work on 2 metre and 70 cm bands. Respond to b.doncliff@inet.net.au

## FOR SALE SA

VK5JST Antenna Analyser kits. (see AR article May 2006). Join the ranks of world-wide enthusiasts and build yourself an extremely useful item for your shack plus improve your HF antenna efficiency. For more details see www.scarc.org.au; contact SCARC PO Box 333 Morphett Vale SA 5162, or email: kits@scarc.org.au

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The Ozi-Data interface, a radio data interface kit for PSK31, SSTV, etc. \$50 + \$5.50 Postage to VK. The Mid North Coast Amateur Radio Group Inc. P.O. Box 505 Bellingen NSW 2454  
http://www.mncarg.org/ or mncarg@yahoo.com.au

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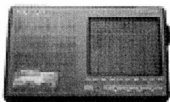
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*Chairman of the regional committee is in bold*

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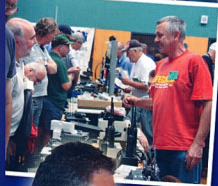
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| <b>VK1</b> | VK1WIA: | Sunday 0900 local on the Mt Ginini repeaters 146.950 and 438.050 MHz. The UHF repeater requires 123 Hz access tone and is linked to the Goulburn repeater.   |
| <b>VK2</b> | VK2WI:  | Sunday 1000 and 1930 local, on 1.845, 3.595, 7.146, 10.125, 14.170, 28.320, 52.525, 145.6000, 147.000, 438.525 and 1273.500 MHz. Also 5.425 MHz USB in the morning...<br><br>Plus provincial relays both sessions and country relays in the morning via local repeaters. VK1WIA news is included in the morning.                         |
| <b>VK3</b> | VK1WIA: | Sunday 10:30 am and 8 pm Local Time. Amateur Radio Victoria VK3BWI B/cast Network: 3.615, 7.158, 10.130, 147.250 VK3RMM Mt Macedon, 146.700 VK3RML Mt Dandenong, 147.225 VK3RWG Mt Baw Baw, 438.075 VK3RML Mt St Leonard.  |
| <b>VK4</b> | VK1WIA: | Sunday 0900 local via HF and major VHF/UHF repeaters.  |
| <b>VK5</b> | VK5WI:  | Sunday 0900 local, on 1.843, 3.550, 7.140, 28.470, 53.100 AM, 146.900 (SE), 146.925 (CN), 147.000 and 439.975  |
| <b>VK6</b> | VK6WIA: | Sunday 0900 local, on 1.865, 3.582, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120, 50.150, 146.700 and 438.525 MHz. Country relays on 3.582 MHz and major repeaters.<br>Repeated Sunday, 1900 local, on 1.865, 3.565, 146.700 and 438.525 MHz. Country relays on major repeaters.<br>Also in 'Realaudio' format from the VK6WIA website. |
| <b>VK7</b> | VK7WI:  | Sunday 0900 local, on 1.840 AM and 3.570 MHz and on major repeaters.<br><br>VK7 regional news follows at 0930 local, on 7.090 and 14.130 MHz, and on major repeaters.  |
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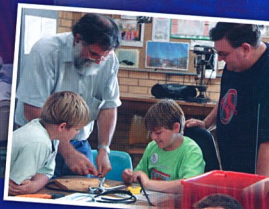
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